

**NEW!
ATARI
ST**

U.S.A. \$3.50
CANADA \$4.50

Antic[®]

The **ATARI[®]** Resource

OCTOBER 1985

VOLUME 4, NUMBER 6

MIND TOOLS

ST Encyclopedia-on-a-Disk

Halley's Comet Software

**Atari BASIC
into GEM C**

**Student Rates
the SATs**

**Spectacular
Online Graphics**

**Mac Clobbered in
ST Speed Test**

INSIDE: 7 Type-In Programs



10

TRENTON MI
AN 65249R5T019J 03
MAR 86
*****5-DIGIT 48183

Lyco Computer Marketing & Consultants



SAVE ON THESE IN STOCK PRINTERS



CARDCO		JUKI		LEGEND	
32K BUFFER (C-64)	59	Juki 6100	375	880	199
		RS232 Serial Board	55	1080	225
		6100 Tractor	119	1380	265
		6100 Sheet Feeder	209	1385	299
		Juki 6300	765		
CITIZEN		OKIDATA		DIGITAL DEVICES	
MSP-10	289	Okimate 10	CALL	16K BUFFER	75
MSP-15	449	Okimate 20	CALL	32K BUFFER	89
MSP-20	449	182	215	64K BUFFER	125
MSP-25	569	192	349		
Sheetdr (10/20)	189	193	565		
Sheetdr (15/25)	199	92P	349		
		93P	565		
		84P	645		
		92 imagewriter	349		
		*IBM versions also			
CORONA		BROTHER		TOSHIBA	
LP300 Laser Printer	2699	HR-15XL-P	359	P1340	559
200361 Toner Cartridge	89	HR-15XL-S	359	P351	1289
		HR-35P	839		
		HR-35S	839		
		2024L-P	949		
		M1009-P	189		
EPSON		DIABLO		MICROBITS	
LX80 (NEW)	225	D25	549	Microstuffer	99
FX80 +	349	630API	1599		
FX100 +	479	630ECS	1759		
JX80 Color	489	D801F	2395		
RX100	369	P32CQ1	699		
HOMEWRITER 10 (New)	CALL	P38	1749		
CR220 (C-64)	159	C150	999		
LO1500 Par	999				
LO1500 Ser	1059				
Hi80 Color Plotter	379				
C. ITOH		STAR MICRONICS		SILVER REED	
PROWRITER 8510AP	279	SG-10	215	EXP400	249
8510AP +	299	SG-15	375	EXP500	295
8510BPI	309	SD-10	339	EXP550	409
8510SP	375	SD-15	445	EXP770	749
8510SR	425	SR-10	485		
8510SCP	449	SR-15	585		
8510SCR	469	PowerType	305		
7500AP	205	SB-10	CALL		
7500AR	245	SG-10C-64 (NEW)	CALL		
1550P	439				
1550AP +	459				
1550BCP	469				
A10-30P	445				
F10-40P or S	859				
F10-55P or S	1039				
F10 Tractor	159				
F10 Sheet Feeder	249				

MONITORS

TAXAN		SAKATA		NEC		ZENITH		AMDEK	
115 12" Green Composite	CALL	SG1000 12" Green	99	JB-1260 Green	95	ZVM 122A Amber	84	300 Green	125
116 12" Amber Composite	CALL	SA1000 12" Amber	109	JB-1201 Green	135	ZVM 123G Green	75	300 Amber	139
121 12" Green TTL	135	SG1500 12" Green TTL	129	JC 1215 Color	235	ZVM 124 Amber IBM	129	310 Amber IBM	155
122 12" Amber TTL	145	SA1500 12" Amber TTL	129	JC 1216 RGB	375	ZVM 131 Color	275	Color 300 Audio	245
220 14" Color Composite	255	SC1000 13" Color Comp	209	JC1460 Color	265	ZVM 133 RGB	389	Color 300 Composite	369
410 12" RGB Hi Res IBM	329	SC200 13" RGB	389	JB-1205 Amber	139	ZVM 135 Composite	449	Color 600	429
420 12" RGB Super Hi Res	409	STSI Tilt Stand	29			ZVM 136 Hi Res Color	589	Color 700	495
440 12" RGB Ultra Hi Res	569							Colcr 710	569
Tilt Stand	35								
PANASONIC		PRINCETON GRAPHICS		X-TRON					
DT 1300 RG1 composite	299	MAX-12 Amber	189	Comcolor I Composite Green	185				
		HX-12 RGB	475						
		SR-12 RGB	599						

MODEMS

DRIVES

PRINTER INTERFACE

DISKETTES

HAYES		INDUS Atari 215		AXIOM		SKC (Box 10)	
SMARTMODEM 300	139			AT846 (Atari)	65	5 1/4" SSDD (Qty)	10 100 500
SMARTMODEM 1200	379					5 1/4" SSDD	13 75 12 99 11 99
SMARTMODEM 1200B	349			ATARI		5 1/4" DSDD	15 75 14 99 14 25
SMARTMODEM 2400	599			850 Interface	109		
MICROMODEM IIE	135			DIGITAL DEVICES		ELEPHANT (Box 10)	
ANCHOR				ApeFace XLP (Atari)	49	5 1/4" SSDD	13 50 12 99 11 99
Volksmodem	55			U-Print A (Atari)	54	5 1/4" SSDD	14 99 13 99 12 99
Volksmodem 12	186			U-CALL RS232 (Atari)	37	5 1/4" DSDD	16 99 15 99 14 99
Mark 12	229			CARDCO		Premium SSDD	15 95 14 95 13 95
MICROBITS				C/?AT (Atari)	49	Premium DSDD	17 95 16 95 15 95
MPP100E (ATARI)	75						
MAXELL (Box 10)							
5 1/4" MD-1	16 75 15 75 14 75						
5 1/4" MD-2	22 99 21 99 20 99						

ATARI SOFTWARE

ATARI		ATARI SOFTWARE (NEW)		MICROPROSE (Atari)		BRODERBUND (Atari)	
800XL	CALL	Codewriter	35.75	Kennedy Approach	21.75	The Print Shop	28.95
130XE (NEW)	CALL	Filewriter	20.75	Crusade in Europe	24.75	Graphics Library	18.95
520ST (NEW)	CALL	Reportwriter	20.75	Decision in Desert	24.75	Graphics Library II	19.50
1050 Drive	165	Menuwriter	20.75	Solo Flight	20.75	Bank St. Writer	42.75
1010 Recorder	42	Home Integrator	19.75	Nato Commander	20.75	Whistler's Brother	18.95
1020 Printer	55	Small Bus Inventory	11.75	Spiritfire Ace	18.75	Spelunker	18.95
1025 Printer	159	Salesman Expenses	11.75	F-15 Strike Eagle	20.75	Sleath	18.95
1027 Printer	179	Accs Rec/Pay	11.75	Hellcat Ace	20.75	Serpent's Star	24.95
850 Interface	109	Retail Invoice	11.75			Mask of the Sun	24.95
		Final Legacy	15.75				
		Adventure Writer	18.75				
		Star Voyager	11.75				
SUB LOGIC (Atari)							
Flight Simulator II	32.75						
Night Mission Pinball	20.75						

TOLL FREE 1-800-233-8760



TO ORDER



CALL TOLL FREE

800-233-8760

Customer Service 1-717-327-1825 Jersey Shore PA 17740

or send order to
Lyco Computer
P O Box 5088

RISK FREE POLICY

In stock items shipped within 24 hours of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO, FPO and international orders add \$5.00 plus 3% for priority mail service. Advertised prices show 4% discount for cash, add 4% for MasterCard or Visa. Personal checks require 4 weeks' clearance before shipping. Ask about UPS Blue and Red label shipping. All merchandise carried under manufacturer's warranty. Free catalog with order. All items subject to change without notice.

Imagine...

**A WORD PROCESSING PROGRAM!
AN INFORMATION MANAGEMENT PROGRAM!
A TELECOMMUNICATIONS PROGRAM!**

ALL THREE PROGRAMS, ON ONE DISKETTE!, FOR ONLY \$49.95*!

"Quite simply the best! The highest rating possible...the package should be part of every (computer) library." — ANALOG COMPUTING

"Russ Wetmore has done an EXCELLENT job! The program is flexible, powerful and very easy to use. \$49.95 buys a heck of a lot of program." — REVIEW BY ARTHUR LEYENBERGER

"Performance: ★ ★ ★ ★ (Excellent) Value: ★ ★ ★ ★ (Excellent)"

This three-in-one package is a bargain... one of the finest values on the market."

FAMILY COMPUTING

HOMETEXT WORD PROCESSOR.
HOMEFIND INFORMATION MANAGER.
HOMETERM TELECOMMUNICATIONS

Together they are **HomePak**: the three most important and most useful home computer applications in one integrated system — on one diskette!

The reviewers are unanimous: any one of these programs **alone** is well worth the price. So you're getting **three times the computing power**, with this exceptionally easy to use package:

- all commands in simple English; no complex computer jargon, no obscure instructions
- all key commands are immediately available on the screen menu; additional commands can be called up for the more experienced user
- to help you, system status is displayed right on the screen

And it's easy to use the three programs together. For example, in the "Merge" mode, you can take data stored in **HOMEFIND** and print letters and labels using **HOMETEXT**. Or, use **HOMETEXT** to write reports based on information you've called up via **HOMETERM**.



BATTERIES



INCLUDED

"The Energized Software Company!"

WRITE TO US FOR FULL COLOUR CATALOGUE of our products for COMMODORE, ATARI, APPLE and IBM SYSTEMS

FOR TECHNICAL SUPPORT OR PRODUCT INFORMATION PLEASE PHONE (416) 881-9816

*MANUFACTURERS SUGGEST U.S. LIST PRICE

© 1985 BATTERIES INCLUDED. APPLE, ATARI, COMMODORE AND IBM ARE REGISTERED TRADEMARKS RESPECTIVELY OF APPLE COMPUTERS INC., ATARI INC., COMMODORE BUSINESS MACHINES INC. AND IBM BUSINESS MACHINES INC.

30 Mural Street
Richmond Hill, Ontario
L4B 1B5 CANADA
(416) 881-9941
Telex: 06-21-8290

17875 Sky Park North, Suite P
Irving, California
USA 92714
(416) 881-9816
Telex: 509-139

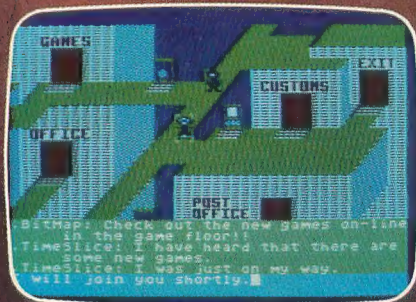
THE CREATION OF A NEW BREED



The GCP Network: More Communications, More Graphics, LESS Hassle!

The GCP City:

The entry to
worlds of adventure
and challenge.



The Game Floor:

Choose your
favorite and match
wits with others.



Lords of Space:

Explore and conquer
your way to
galactic supremacy.



FEATURES: Joystick-driven; no commands to learn! Private mail, bulletin boards, program library, file transfers, automatic logons, User Group support, local phone call access from most cities, no network surcharge. **SYSTEM REQUIREMENTS:** 48K Atari, 1 disk drive, modem.

For more information contact:

GCP **GAMES
COMPUTERS
PLAY, INC.**

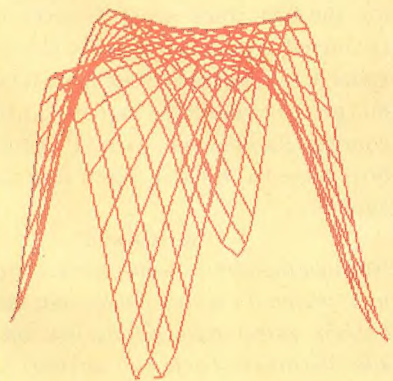
112 East Market Street, York, PA 17401 / 717-848-2660



524 megabytes 14



1st ST program listing 20



Graph 3D 46

FEATURES

- BANJO PICKER** by Richard Lindgren 28
Play bluegrass music like a bionic Earl Scruggs! TYPE-IN SOFTWARE
- SEE HALLEY'S COMET ON YOUR ATARI** by Gigi Bisson 36
New software super-maps
- A STUDENT TESTS S.A.T. SOFTWARE** by Dianna Harms 40
Grades for Krell and HBJ
- YOGA BREATHING** by Len Dorfman & Jerry White 44
Your Guru, the Atari TYPE-IN SOFTWARE
- GRAPH 3D** by Paul Chabot 46
Spectacular three-dimensional visuals! TYPE-IN SOFTWARE

ST SECTION

- BOOKSHELF ON A LASER DISK** 14
by Nat Friedland
ST searches 540 megabytes in 3 seconds
- GEM COLOR CASCADE** by Patrick Bass 20
How to convert an 8-bit Atari program for the ST TYPE-IN SOFTWARE
- FIRST ST PERFORMANCE TEST** by Patrick Bass 24
Mac eats the ST's dust!
- ST PRODUCT NEWS** by Jack Powell 26
First ST book review

SOFTWARE LIBRARY

- TYPE-IN LISTINGS SECTION** 51

DEPARTMENTS

COMMUNICATIONS

- GAMES COMPUTERS PLAY** by Eric Clausen 8
New online service featuring superb graphics

GAME OF THE MONTH

- ALIEN ASYLUM** by Spencer Craske 31
Win sanity points or else! TYPE-IN SOFTWARE

BONUS GAME

- LEMONADE** by Bob Polaro 32
APX hit educational game! TYPE-IN SOFTWARE

ASSEMBLY LANGUAGE

- FINE SCROLLING WORLD: PART II** by Mark Andrews 72
Dot-by-dot screen moves, 8 times smoother! TYPE-IN SOFTWARE

- | | | | |
|------------------|----|----------------------|-----|
| I/O BOARD | 6 | PRODUCT REVIEWS | 76 |
| HELP | 7 | SHOPPERS GUIDE | 80 |
| ANTIC ONLINE | 7 | NEW PRODUCTS | 82 |
| ADVERTISERS LIST | 74 | ANTIC ARCADE CATALOG | AC1 |

Publisher
James Capparell
Editorial

Nat Friedland, Editor; Jack Powell, Technical Editor; Charles Jackson, Program Editor; Patrick Bass, ST Program Editor; Gigi Bisson, Assistant Editor; Rebecca Hale, Editorial Coordinator; Ron Luks, On-Line Editor.

Contributing Editors

Carl Evans, Ken Harms, Jerry White, Suzi Subeck, Anita Malmig.

Art

Marni Tapscott, Art Director; Diane Lindley, Production Supervisor; Linda Tapscott, Ad Production Coordinator; Julianne Ososke, Production Assistant.

Cover Illustration

Alan Okamoto

Circulation

Les Torok, Circulation Manager; Hun-sik Kim, Shipping; Monica Burrell, Subscriptions; Eve Gowdey, Dealer Sales; Brandt/Klingel, Circulation Consultants.

Accounting

V.J. Briggs, Accounting Manager; Brenda Oliver, Accounts Receivable; Lorene Kaatz, Credit Manager; Andrew Pope, Customer Service, Retailers; Nelly Rodriguez, Data Processing.

Marketing

Gary Yost, Director, Marketing; Brad Kershaw, Product Specialist; Lisa Wehrer, Customer Relations.

Advertising

Steve Randall, Advertising Director; Harvey Bernstein, Sales; Garland & Associates, East Coast Representatives.

Maria E. Chavez, Receptionist
Fidez Bituin, Clerical

General Offices

& Catalog Customer Service
(415) 957-0886

Subscription Customer Service
(614) 383-3141

Antic, P.O. Box 1919, Marion, OH 43306

Advertising Sales (415) 661-3400

Garland & Associates (617) 749-5852

Credit Card Subscriptions & Catalog Orders
outside California (800) 227-1617 ext. 133
inside California (800) 772-3545 ext. 133

October 1985, Volume 4, Number 6

Antic—The Atari Resource is published twelve times per year by Antic Publishing. Editorial offices are located at 524 Second Street, San Francisco, CA 94107. ISSN 0745-2527. Second Class Postage paid at San Francisco, California and additional mailing offices. POSTMASTER: Send address change to **Antic**, P.O. Box 1919, Marion, OH 43306.

Editorial submissions should include program listing on disk or cassette, and text file on media and paper if text was prepared with a word processor. Media will be returned if self-addressed stamped mailer is supplied. **Antic** assumes no responsibility for unsolicited editorial material.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Antic is an independent periodical not affiliated in any way with Atari Corp. ATARI is a trademark of Atari Corp. All references to Atari products are trademarked and should be so noted.

Antic is a registered trademark
of Antic Publishing, Inc.

Copyright ©1985 by Antic Publishing.
All Rights Reserved. Printed in USA.

i/o board

1027 INK ROLLERS

I'm having a very hard time finding the printer ink rollers for my Atari 1027 printer. No retail shops here in the Florida Panhandle carry these. Could you help me?

Bruce Daniel

Niceville, FL

The friendly folks at Atari Customer Service assured us that they have a plentiful supply of these, although they are not common around the country. They can be ordered directly from Customer Service for \$3.98 each.

*Atari Customer Service
1196 Borregas Avenue
Sunnyvale, CA 94086*

kyan QUERY

I've heard of a kyan Pascal package for \$69.95. Can you tell me something about it before I invest?

Robert Stadler

Look for a review of kyan Pascal in these pages next month.—ANTIC ED

130XE TIPS

Has anybody noticed that on a 130XE, one does not need to press [SHIFT] along with [CAPS] to enter upper-case letter mode? Also, for some reason typing RUN in inverse video works (but not RUN "D:).

Frank Imburgio

Setauket, NY

ACCURATE ATARIWRITER

Can you give me some information on a spelling checker program that will work with AtariWriter?

Tony M. Han

Oak Grove, MO

The Antic Arcade Catalog has one program, Spell Magic, which will work with AtariWriter. Also, this year Atari will be bringing out an improved version of AtariWriter called AtariWriter Plus. This

will have a built-in spelling checker as well a mailmerge function. And it will also contain three 15K switchable file banks that can be fully utilized on the 130XE computer.—ANTIC ED

PRINT SHOP LINKS

I have found Print Shop to be a superb program except for one small item. It produces striped printouts on my BMC BX-80 when I use it with their BMC or Epson printer setups.

However, when I use the Mannesmann Tally Spirit 80 setup my printouts are perfect. I thought you might want to pass this information on to other Atari owners.

Bob Whipple

Clementon, NJ

You may want to pass this information on to your readers who own Star Gemini 10X printers and are contemplating acquiring Print Shop.

The software performs flawlessly, with the exception of printing banners. The result is not as described. Instead you get a checkerboard pattern, rather than solid lines as with greeting cards, letterheads and signs. This was confirmed by Broderbund in a letter they sent me.

Hisham M. Saaid

Frankfort, KY

PARTS YOU NEED

I have enjoyed your magazine very much for the last three years. I never encountered a problem worth writing in about before, but I have one now. Where do I get the cable for the Atari 600XL that connects the computer to the TV switch-box? Mine has broken, and I can't find another.

K. Kidwell

We spoke to Atari Customer Service. Atari now prefers to repair cables that have broken, rather than selling new ones. Take the broken cable into an Atari Service Center. Or send it to Atari Customer Service, they will fix it for you and return it COD.

SPINNAKER SUPPORT

Spinnaker Software would like all readers of *Antic* Magazine to know that it intends to fully support the new Atari ST computers. Spinnaker was the first major publisher to announce support for the ST, and we intend to support the machine across each of our brands: Spinnaker, Fisher-Price, Telarium, Windham Classics and Better Working.

It takes time to convert software to a new computer, especially when it has such wonderful new features. We will have the first of our products available in September, and should have 10 different titles available for Christmas.

Spinnaker has been a long supporter of Atari Computer products, and we intend to remain so in the future.

William H. Bowman
Chairman
Spinnaker Software

Type GO ANTIC when you log onto **CompuServe** in September. On ANTIC ONLINE you'll always find the latest news about the bonanza of sophisticated software coming soon for Atari ST computers.



WUN BOARD NEWS

Members of Atari users groups affiliated with the Worldwide Users Network will want to see the coverage of the first WUN Board of Directors Meeting. The WUN grassroots movement should have some exciting developments for members this autumn.


Featured this month on ANTIC ONLINE is the complete eight-lesson course in Assembly Language by famed game designer Chris Crawford.

You'll find all eight lessons in the Worldwide Users Network pages.

And don't forget that a complete Antic Arcade Catalog customer service system is now available on ANTIC ONLINE. Follow the Antic Central Menu Prompts to upload your queries for quick email response.

SIGNING UP

If you're not a CompuServe subscriber yet, see your local computer dealer or phone (800) 848-8199 for information about signing up. Ohio residents phone (614) 457-0802. There is no extra charge for accessing ANTIC ONLINE.

Now ANTIC ONLINE (and SIG * Atari) are also available on the **Delphi** service at a saving of \$6 per hour for 1200 baud access. Phone (800) 544-4005 for information about signing up with Delphi. Massachusetts residents phone (617) 491-3393. 

help!

ATARI 'TOONS

The 22nd data character in line 1090 of Listing 2 in Atari 'Toons (August, 1985) is an A. The A got smudged during final printing. Because this will undoubtedly throw off many contestants, the Atari 'Toons contest deadline is being extending by one month.

Also, 'Toons will only load standard size character sets. To fix this, change **NUMBER=1024**, in line 1140 to, **NUMBER=2050**. And change line 1150 to: **1150 GOTO 1170**.

November 1, 1985 is the new deadline for entries to arrive at *Antic*. First prize in the Atari 'Toons contest is a 1200 baud modem.

STAR VENTURE

Our July, 1985 bonus game, Star Venture,

has difficulty restarting. Change line 380 to the following:

```
380 IF PEEK(53279)=6 THEN  
EN SOUND 0,0,0,0:GOTO 8  
0
```

MUSICIAN

If you're having problems with tempo changes in Musician (*Antic*, June, 1985) remove line 1720 and add the following line:

```
1715 IF A=14 THEN TEMPO  
=-0.25:GOTO 1700  
1720 REM REMOVE THIS LINE
```

TYPO II MATH WIZ

This issue, in the Software Library pages,

you'll find the TYPO II line codes for Math Wizard, a Matthew Ratcliff educational game that *Antic* published in April, 1984.

The July, 1985 *Antic* also provided TYPO II correction codes—for all three popular 1984 games by J.D. Casten plus Adventure Island (November, 1984).

CUSTOM PRINT

When you use a redefined character set, Custom Print (March, 1985) has trouble printing certain characters—such as !, #, \$, and so on. To correct this, change line 5 to:

```
5 CS=PEEK(106)-8:  
POKE 106,CS-1:GRAPHICS  
0:DIM CST$(20):CST$=""
```


GAMES COMPUTERS PLAY

*Superb
color graphics
online*

by ERIC CLAUSEN

You log onto **Games Computers Play** and suddenly you're in a wonderland of boldly geometric color graphics, with perspectives that come at you from startling angles.

The whole scene could have been designed by M.C. Escher. Or you might be in a vast game of **Realm Of Impossibility**, the Electronic Arts update of the earlier classic **Zombies**. Except you're online and your Atari's playmate is a powerful 300-megabyte minicomputer based in York, Pennsylvania.

Games Computers Play (GCP) is a unique new commercial online service that features state-of-the-art color graphics and easy icon control by joystick. GCP also offers exciting interactive games, real-time conferencing, electronic mail and public domain downloads.

Online since January 1985, GCP is just for Atari computers with 48K memory, disk drive and modem. Currently supported are Hayes Smart-Modems and compatibles, plus the Atari 1030 and 835 modems. MPP support may come in the future.

GCP costs only \$6 an hour from 6 pm to 7 am and throughout the weekend. Weekday "prime time" is \$15 an hour. A one-time \$30 signup fee gives you five free hours online, so in effect it costs you nothing extra.

There's no extra charge for 1200 baud, in fact it's highly recommended because of the large amount of data needing to be transferred for updating the graphics screens.

GCP subscribers get a total of three disks, which support the online graphics cues for different areas of the system. This approach is one of those

brilliantly simple ideas that you wonder why nobody ever thought of before.

User friendliness is the hallmark of GCP. Keyboard commands are simple and kept down to a minimum. You'll control most of what you do online simply by moving your "droid" icon with a joystick.

Even the process of logging on is totally automated if your modem supports autodialing. It's very simple to configure the GCP boot disk for your modem, and then you're ready to go online.

ENTERING GAMEWORLD

As you log on, an ornate set of doors bearing the GCP logo slides open. You are in the CustomsOffice where you



Customs Office



CyberTank Combat



Cybership Design

Continue on page 10

• WIN AN ATARI DISK DRIVE • MORE FREE BONUSES • NEW LOWER PRICES

WIN an Atari disk drive! Simply enclose a 3" by 5" with your printed name and address on ONE side AND on the OTHER side tell us in 25 words or less why you like LotsaBytes! The winner will be selected on the basis of originality, content, and clarity from all entries received postmarked on or before September 30, 1985. All entries will become the property of LotsaBytes. No purchase necessary. Void where prohibited by law.

LotsaBytes offers QUALITY, QUANTITY, SELECTION, LOW PRICES, FREE BONUSES, and a FULL 100% REPLACEMENT GUARANTEE ON DEFECTIVE DISKS (including return postage). Our National Public Domain Copy Service searches the most popular magazines, B.B.S., and User Group libraries to save you TIME, WORK and MONEY. Most of our P.D. disks are double-sided, giving you more programming for less money. Our other software titles are discounted up to 50% and more. GIVE US A TRY AND BECOME ONE OF OUR THOUSANDS OF SATISFIED CUSTOMERS!

PUBLIC DOMAIN SOFTWARE

#1 GAMES Two full disk sides packed with 25 games including some 'Arcade'. \$ 7.95	#2 UTILITIES 25 Powerful programs to help you get the most out of your Atari. \$ 7.95	#3 AMS MUSIC Listen to your Atari play the 25 songs on these 2 disk sides. Self contained with Player Pprogram \$ 7.95	#4 GAMES 14 better games on two disk sides with some Arcade types. \$ 7.95	#5 EDUCATION Loaded with 28 programs on two disk sides. Fun learning for the entire family. \$ 7.95
#6 AMS MUSIC 25 more all-time favorites to sing along with on two disk sides. With Player Program. \$ 7.95	#7 GAMES 14 MORE better games on two sides. More Arcade types. \$ 7.95	#8 UTILITIES 17 more power-packed programs to help unleash the full potential of your Atari. \$ 7.95	#9 GAMES Filled on both sides with 17 of the better games around. Arcade type. \$ 7.95	#10 UTILITIES Another assortment of 17 programs that should be in everyone's library \$ 7.95
#11 GAMES Two sides filled with 19 great games. Many Arcade types. \$ 7.95	#12 ADVENTURES 13 fantastic text type adventures for your enjoyment. Two sides. \$ 7.95	#13 EDUCATION 24 entertaining and educational programs for the whole family. Two sides. \$ 7.95	#14 AMS MUSIC The automatic Player lets you listen to another 24 great songs on two sides. \$ 7.95	#15 UTILITIES Another assortment of 21 fine programs to 'educate' your Atari. \$ 7.95

#16 MUSIC MAJOR!
You can learn the basics of music with this fine program. Note recognition, key signatures, and note counting are among the many topics. For use by the individual or in the classroom. Originally \$39.95 Send another \$3.00 for a complete Student Guide. **New! \$ 7.95**

#17 MICRO-TALES
Written for the 4th or 5th grade levels, but children of ALL AGES will enjoy the action, sound, and music of the fine graphics and text. 'Turn the pages' and watch their eyes light up to THE NOISY GIANT and CAVEMAN JOE. Two sides. **New! \$ 7.95**

INSTEDIT

The Atari Program Exchange (APX) called this "the best Character set editor we've seen". And no wonder! You can create special math and chemistry symbols, foreign language alphabets, or special typefaces. By positioning several characters together, you can even create hi-res pictures! Advanced users familiar with player missile graphics can even use it to design players. From beginner to expert, this is for you. Complete with a 20 page manual. Joystick required.

24.95 value

LotsaBytes price \$12.95

New! STAR LORDS by Walt Huber

Until the 24th Century man was confined to Earth, the solar system and a few nearby stars. Portals were predicted and soon discovered, allowing exploration of the Galaxy. Colonization proceeded rapidly, differences arose, wars were fought, and soon the Galaxy was on the eve of destruction. Peace came in the 27th Century. Disputes were decided by specially trained STAR LORDS commanding unmanned ships and robot satellites duelling in the far reaches of Space. Ultimate victory meant complete control of the Galaxy! You have just completed your training and your ability to command and control will determine the outcome of the conflict. (Text/graphics). (Complete instructions)

\$39.95 value

LotsaBytes price \$14.95

ESI WRITER!

A quality WORD PROCESSOR that out-performs others costing over \$100. It works with almost any printer and is the FASTEST WP you can buy. Features include a built in Help Screen, Justification, Search, Replace, Insert, Page Numbering, Headers, Centering and much more! It can load in other WP files, has friendly messages, and comes with over 50 pages of documentation and tutorials. Works with any Atari, but some configurations will require a translator disk. No printer drivers are required and you can use every feature of your printer. Disk only.

Originally \$49.95

LotsaBytes price \$19.95

SUPER STUD POKER

by Walt Huber

Now you can play hand after hand, against intelligent opponents with infinite patience and the only thing you'll lose is ignorance of the game. There are ten computer opponents of varying skills to choose from and YOU CAN PLAY EIGHT POPULAR STUD POKER GAMES, including Stud, Stud Lowball, Stud HiLo and Hi Chicago. A wild card can be added to the deck also. Anyone care for a friendly game of Poker? Joystick required.

\$29.95 value **New! Only \$12.95**

ORIGINAL ADVENTURE

by Bob Howell

For all Atari computers. The Original Colossal Cave Adventure faithfully reproduced from the 'main-frames' This is the one that launched the whole Adventure craze of today!

- * 20 mazes
- * 130 rooms
- * Deadly Dragons
- * Nasty Dwarves
- * Tenacious Troll
- * The Pirate & More!
- * 86 coded hints
- * SAVE/RESUME
- * 40k disk

Originally \$29.95 **Only \$14.95**



STONEQUEST by David Strelitz

King Weesey and his subjects lived in great prosperity until the Evil Alchemist stole the GREAT STONE OF PROSPERITY and transported it to his Black Fortress. Unless someone (you?) takes up the Quest and recovers the STONE, King Weesey and his subjects are doomed... You've come to the Castle to try to help, but it won't be easy. There are many traps, pitfalls, and puzzles to solve on the way. Almost everyone you meet will be an enemy and must be out-smarted (or bribed?). Magic is everywhere and in many forms. Will you be strong enough to survive? (Text)

\$39.95 value **New! Only \$14.95**

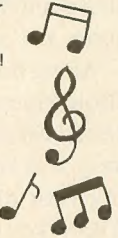
ADVANCED MUSICSYSTEM II

by Lee Actor

Allows you to compose and/or copy music with your Atari computer! All new machine code.

- * Control over pitch duration, envelope dynamic level, meter, tempo and key.
- * 4 independent voices
- * 5 1/2 octaves per voice
- * Save up to 8200 notes
- * Custom DOS
- * FULL instructions
- * 24K disk

Originally \$29.95



Only \$14.95

BACK BY POPULAR DEMAND!

Tricky TutorialTM as LOW as \$7.95 each

TRICKY TUTORIALTM originally sold for up to \$29.95 per copy.

Each is written in an entertaining style and comes complete with disk and manual (up to 66 pages).

- #1 - DISPLAY LISTS**
Learn to create your own graphics and text modes.
- #2 - SCROLLING**
Explains how to move the screen over maps of graphics or text.
- #3 - PAGE FLIPPING**
Change the entire screen instantly to another display picture.
- #4 - BEGINNING ANIMATION**
Learn to create the illusion of movement using simple shapes.
- #5 - PLAYER MISSILE GRAPHICS**
Create your own 'PACMAN' type game while learning about Collisions, Backgrounds, Players, Scoring, and more.
- #6 - SOUND & MUSIC**
Learn a simple way to write music and sound effects on your Atari.
- #7 - DISK UTILITIES**
Seven disk tools. FORMATER, INSPECTOR, AUTORUNSMYMAKER, RPM CHECKER, MENU MAKER, DIRECTORY PRINTER & FILES TUTORIAL.

- #8 - CHARACTER GRAPHICS**
Change letter shapes into anything you wish. Includes an editor that makes creating and animating the shapes easy; and a linker that actually writes BASIC code. Complete game included as an example.
- #9 - GTIA GRAPHICS**
Use graphics modes 9 to 11 to create 3-D shapes. Place 16 colors on the screen at once, and even digitize pictures using these new modes. Includes a 9 color picture editor.
- #10 - SOUND EFFECTS**
30 simple sound effects like lasers and bombs, and an effects editor. Explains how to combine sounds and graphics, and 16 bit sounds for extended range.
- #11 - MEMORY MAP TUTORIAL**
How to control cursor text windows, user keys, joysticks and paddles, tabs, inverse video, upside down letters, break key protection, and 25 more.

- #12 - S.A.M. TUTORIAL**
Learn to make S.A.M. sing, change voice, sound, add graphics, explore phonemes, and change inflection. Requires S.A.M. by Don't Ask.
- #13 - BASIC TOOLS**
Adds the following to BASIC: RE-NUMBER, DELETE, TRACE, EXPAND, QUICKREF, AND LISTER.
- #14 - ADVANCED PROGRAMMING TOOLS**
Machine language tools used to write commercial programs useable from Basic or Assembly. PLAYER MISSILE MOVEMENT, TIME DELAYS, SOUND EFFECTS, PAGEFLIPPING, MEMORY MOVEMENT, SPECIAL CHARACTER FONTS, and SAVE FULL GRAPHICS SCREENS (I/O) IN SECONDS.
- #15 - FANCY FONTS**
Includes many sample fonts, an editor, and adds a new set of sub-routines you can call to create great displays. Print the fonts out on your printer as you create them.

Buy 1 to 5 at only \$11.95 each • 6 to 10 at only \$9.95 each • 11 to 15 at only \$7.95 each

* * FREE BONUSES * *

New Lucky 7 — 11 Bonuses

Don't even ask how we can do it! We've decided to give even more free bonuses for larger purchases. FOR EACH 3 DISKS PURCHASED YOU MAY CHOOSE 1 FREE! BUT IF YOU BUY 7 DISKS, YOU NOW MAY CHOOSE 3 FREE BONUSES. AND IF YOU BUY 11 DISKS, YOU MAY CHOOSE 5 FREE BONUSES! Here's a recap: For Each 3 disks you get ONE free. If you buy 7, you get one extra (Buy 7 - get 3). If you buy 11, add two extra (buy 11 - get 5). WOW!!

Choose from the following:

- a. A XL/XE Translator disk to use most 800 software. (recommended!); or
- b. The new DOS 2.5 for 1050 owners now using DOS 3.0 (only); or
- c. Any of the LotsaBytes Public Domain disks #1 thru #17.

* * FREE BONUSES * *

TERMS: All defective disks will be replaced free including return postage. Write first with details for Return Authorization. All orders are shipped by U.S. Mail. Add \$1.95 shipping and handling for 1 to 5 disks. Add \$2.95 for 6 to 10 disks. Add \$3.95 for 11 to 15 disks. Outside of U.S.A. & Canada add 15% for shipping and handling (Minimum - \$4.00) U.S. Funds ONLY! California residents MUST add Sales Tax. We accept checks and money orders. Sorry, NO Credit Cards or COD. Allow THREE weeks for personal checks to clear our bank. SCHOOL AND GOVERNMENT PURCHASE ORDERS WELCOME!

Sorry, no catalog. We distribute and publish only what we advertise herein.

We encourage software authors to submit their programs for evaluation. We pay competitive royalties on a monthly basis.

Atari is the registered trademark of Atari Corp.

LOTSABYTES

15445 Ventura Blvd., Suite 10G
Sherman Oaks, CA 91413

GAMES

continued from page 8

will be asked to present your username and password. As you pass through customs, you can pick out one of the 15 styles of droid bodies from Wardrobe. Your joystick-controlled droid icon now becomes your onscreen character for exploring and interacting with the world of GCP.

Step past the customs desk to a door marked City and press the joystick button. You are prompted to insert your City Disk. The disk drive whirs for a moment and your droid is transported to the magical realm where much of the GCP action takes place.

As you look around the main plaza you see stairs and corridors leading to rooms labeled Post Office, Social Hall, Games and Office. You can guide your droid into any of these rooms and explore the activities.

Along the way, you may meet other droid characters who represent additional users online with you. You can stop and talk to them simply by typing your dialogue. Pressing the [OPTION] key puts you in Whisper Mode that can only be heard by selected droids. Or you can invite a group into a Social Hall room for an impromptu conference.

The Social Hall is filled with a series of rooms numbered like apartments for easy location. If you meet friends in the corridor you can ask them to meet you in Room 120, for example. Once you're at this actual location, you have the option of closing the room door to exclude other users and carry on a private conversation. Or if you'd like to be more sociable, you can leave the door open and invite everyone in.

CYBERTANK WARRIORS

You may decide after awhile in the Social Hall to engage in a little online

mayhem in the Game room. You insert your Game Disk and invite some of your more fearless friends to join you in a friendly (ha, ha) game of CyberTank.

This little diversion allows you to design your own tank, complete with customized weaponry, and do battle with multiple players in real-time on a colorful scrolling screen. Watch out for the more experienced players who can shoot the wings off a fly from miles away. Actually, they'll help out novices like you as long as you don't get too uppity!

BioWar is a single/multiple player game that's a strategy version of the computer classic Life. You position cell colonies so that you can trap or destroy an opponent.

GCP has more games under construction, SpaceLanes and War. These should be available to subscribers by the time you read this.

Details on War have yet to be released. But SpaceLanes promises to be quite an epic. It features unlimited online players cruising around in their starships and wreaking havoc in a huge electronic universe filled with unlimited realistic planets.

GCP POST OFFICE

The Post Office in GCP represents a masterpiece of software design. Virtually any type of mailing can be sent to any individual user or group of users. Public domain program uploads and downloads are also handled within the post office.

As of this writing, more than 120 public domain downloads were online. You are encouraged to upload any interesting public domain software you may have. A custom file transfer protocol virtually guarantees error free transmission.

The Office is where you frequently may find the systems operators of GCP. If they're online you might

wander in to say hello or ask a few questions. The sysops are very helpful to new users. Of course, you can always leave mail if no one is at work.

ICON POWER

Scattered through all areas and rooms of the GCP world, you'll find icons representing telephones and computer terminals. From the telephones you can contact other online users by typing their usernames, even if you can't see their droids.

The terminals support numerous functions. From a terminal you can type various commands that eliminate the need to walk from room to room. GOTO instantly transports you to a new location, WHO tells you who's on the system and where they are, CHECK MAIL does just that. And there are several other time saving commands.

GCP has recently updated the terminal software to Version 1.02, which speeds up system access. Future updates are to support additional games and faster access times.

The sysops of GCP have ambitious plans for their system. Eventually they'd like to expand to convenience services such as at-home banking and at-home shopping.

Games Computers Play is a fascinating interactive upgrade to the usual online fare. Give GCP a try and you could well be hooked too!

GAMES COMPUTERS PLAY
112 East Market Street
York, Pennsylvania 17401
(717) 848-2660

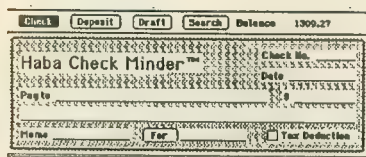


STRATEGIC SIMULATIONS, INC.

Celebrating A New Computer

ATARI® 520ST Software & Peripherals *We're The First!*

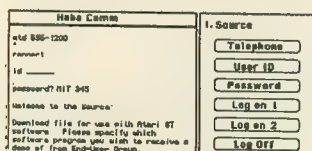
END-USERS GROUP, Inc. presents an original collection of the first software and peripherals available for Atari's terrific new 520ST computer!



Haba Check Minder™:

\$59.95

- A Checkbook and Bill Paying Program to help manage your money.
- Arrange your register by checknumber, date, payee, or income/expense.
- Keeps records logically organized for tax return preparation.
- Automatically sets up accounts as you enter checks and deposits.



HabaCom™:

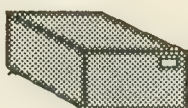
\$59.95

- A straightforward telecommunications program that's easy to use.
- Supports terminal emulation or direct link to computer.
- Full range of baud rates, VT 100 and TTY/CRT, Full/Half duplex.

Haba Hippo "C"™:

\$59.95

- A complete "C" language development system.
- Includes a full "C" compiler, assembler, linker and editor.
- Supports GEM DOS calls and functions.



HabaDisk™ 10 Meg:

\$599.95

- 10 Megabytes of storage capacity.
- Connects directly to your Atari ST.
- Completely self powered.
- Extremely high performance for fast access of information.



HabaModem™:

\$299.95

- A low priced 300/1200 baud modem.
- Fully Hayes compatible.

HabaWord™:

Call

- A very powerful, yet easy-to-use word processor.
- Very large document capabilities.
- Can view multiple documents at one time.

	B	N	I	J	K	
1	8	5,000	15,182	20,182	2,795	2,31
2	9	5,000	17,816	22,816	2,795	2,31
3	10	5,000	19,083	24,083	6,185	3,31

	A	B	C	D
1	11	22		
2	12	21		
3	13	22		
4	14	23		
5	15	24		
6	16	25		
7	17	26		
8	18	27		
9	19	28		
10	20	29		
11	21	30		

HabaCalc™:

Call

- A high powered spreadsheet.
- Both versatile and easy to use.

To Order: Call 818-901-0714

Shipping: add \$3.00 for software products and \$5.00 for hardware products. Payment: Visa, MasterCard, Cashiers Check, Money Order, and COD orders are shipped within 24 hours of receipt. Personal and company checks allow 2 weeks to clear.

or write:

End-Users Group, Inc.
15723 Vanowen St. Suite 326
Van Nuys, CA 91406

Atari is a registered trademark of Atari Corporation. Haba Check Minder, HabaCom, HabaDisk, HabaModem, HabaWord, and HabaCalc are registered trademarks of Haba Systems, Inc. Hippo C is a registered trademark of Hippopotamus Corp

ST

BOOKSHELF ON
A LASER DISK . . 14

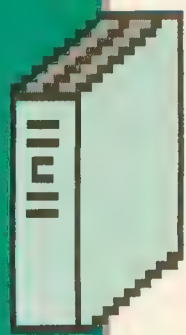
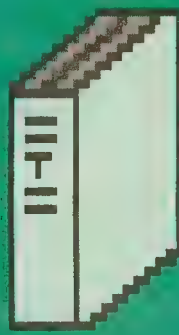
GEM COLOR
CASCADE 20

FIRST ST PERFOR-
MANCE TEST . . 24

ST PRODUCTS . . 26

Browsing through CD ROM

Encyclopedia Bookshelf



BOOKSHELF ON

ST searches 540 megabytes in 3 seconds

by NAT FRIEDLAND, *Antic* Editor

540 megabytes of memory. On a disk that's smaller than a 45 rpm phonograph record.

What does that really mean?

540 megabytes is more than 500 million characters—enough typed characters to stretch 1,000 miles from San Francisco to Denver. It's equal to the amount of information that could be stored on 6,000 Atari floppy disks, or in 50 cubic feet of printed pages...

The businesspeople who go to the huge twice-yearly Consumer Electronics Shows are cynical pros who have seen it all. It takes a lot to get them excited.

But the Atari exhibit at the Chicago CES in June was packing them in to see something genuinely new—the 540 megabyte CD ROM system (Compact Disk, Read Only Memory) running on the 520ST computer.

Software by the Activenture Corp. of Monterey, California put the 26-volume Grolier Encyclopedia on a CD ROM disk—along with a smart database that finds all references for any word in the encyclopedia in three seconds flat.

This system will be premiered only with Atari ST computers. Atari is committed to release a CD ROM player—targeted to retail at \$599—by the end of the year. Grolier will probably price the CD ROM encyclopedia disk at around \$150-200.



Tom Rolander holding the CD ROM disk

DRI BONUS

CD ROM on the ST computers is in fact a major bonus from the Atari-Digital Research connection. The company that developed the three-second encyclopedia-indexing software was founded by Tom Rolander, a former operating systems architecture designer at Digital Research Inc. (DRI).

Rolander has been a close associate of DRI chairman Gary Kildall since they met at the University of Washington 14 years ago. They're both fanatical pilots and share ownership of a small armada of airplanes, in-

cluding aerobatic and ultra-light models. As an individual, Kildall is listed as technical consultant to Activenture.

THE JACKINDISK

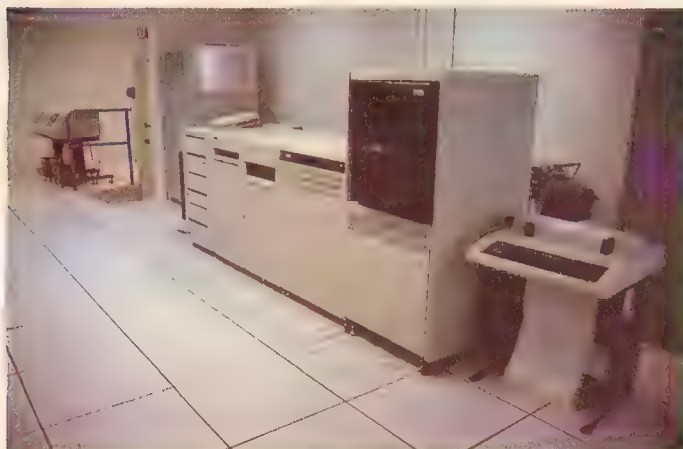
In January 1985, Rolander and Kildall went to see Atari Chairman Jack Tramiel. It was Activenture's very first meeting to raise outside support.

Rolander and Kildall explained how CD ROM took advantage of the new optical disk technology currently becoming popular for digital audio recordings. Read-only optical disks were already being inexpensively

LASER DISK



Video Editing Bank



VAX 11/750

mass produced and could be adapted to hold vast amounts of *any kind* of computer-readable information.

They told Tramiel that the Bible, Shakespeare's complete works, the total card catalog of the Library of Congress, entire medical and law databases, computer programs and video images too—virtually any type of data could be digitized, stored on optical disks, and referenced almost instantly by a personal computer.

Only two CD ROM disks would be needed to store every phone listing in the USA for speedy updating.

A single CD could hold a world atlas, a complete directory of international airline schedules, and detailed information about major destinations. It would be like having an expert travel agent on a disk.

Interactive CD ROM cookbooks could be programmed to recommend recipes based on your input of the ingredients available in your refrigerator or on sale at weekly specials.

After 15 minutes of this, Tramiel looked off into space and said quietly, "This would give people a good reason to buy my new computer, wouldn't it?"

As a result of that meeting, not only will the Atari ST will be first micro-computer to have CD ROM capability—Atari will have exclusive rights to the Activenture process for some time after release.

EXCLUSIVE INTERVIEW

In the person of Technical Editor Jack Powell and myself, **Antic** was the first

continued on next page

WHAT'S A CD?

CD stands for compact disk, which has become the commonly used term for a digitally recorded audio disk that is read by a beam of laser light.

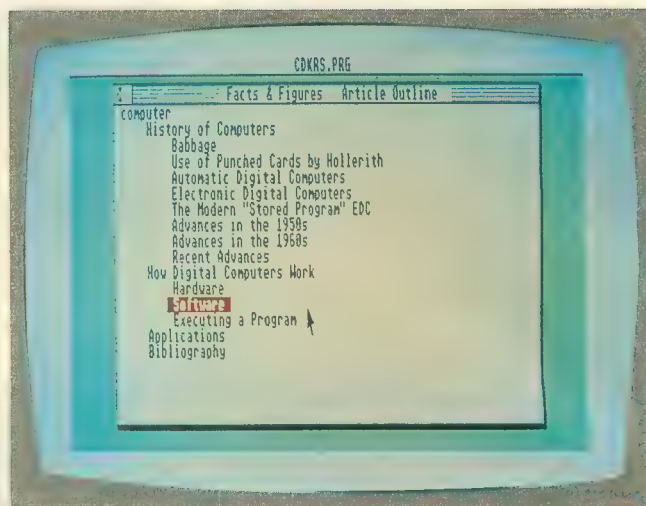
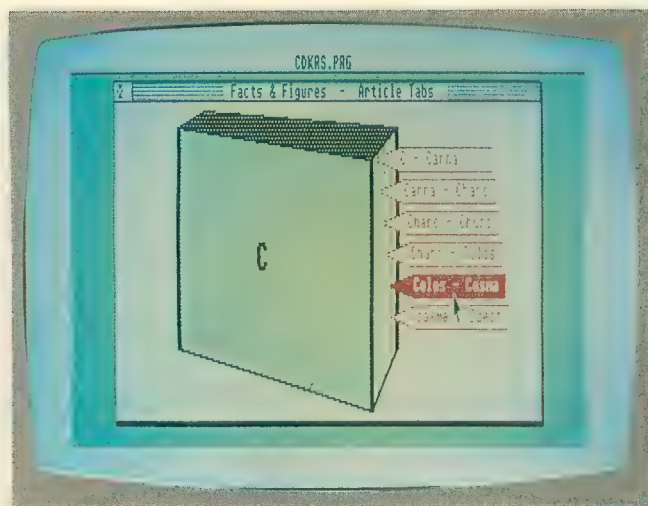
This new digital recording technology has great potential for unprecedentedly fast, accessible, high-density data storage.

Digital audio has become popular very quickly because it reproduces original sound with remarkable accuracy and dynamic range. Compact disks also have virtually no added background noise or distortion. No stylus ever touches a CD to wear it out, there is no tape hiss.

Digital music recording involves sampling the audio signal thousands of times a second. These samples are translated into binary code—the zeroes and ones that make up the bytes in your computer memory. A laser beam cuts the binary code onto a master disk in microscopic "pits."

Compact disks are then pressed from the master and coated with a thin layer of aluminum. They also have a protective layer of plastic that makes the CD extremely hard to damage. A CD player reads the coded pits by using a laser head and a mirror that focuses the light onto an optical sensor.

- BROWSE MODE -



publication to interview Tom Rolander at Activenture after his triumphant return from CES. The company is located in a brand-new high-tech office complex. It's alongside the Monterey Airport so that Rolander can clear his mind with flight breaks, if he gets bogged down in a programming problem.

Enthusiastic and personable, Rolander started **Antic's** visit by showing off the latest version of **Facts and Figures** on an Atari 520ST. This is the program that comes with the encyclopedia disk and controls all the CD ROM operations.

It should be emphasized that the software we saw here and at CES was not merely a demonstration fragment. The program was fully operational, with apparently only minor debugging left.

Rolander called up the Encyclopedia Bookshelf screen and showed us the Browse Mode, which is like flipping through multiple books and pages with unprecedented ease and convenience. Using the mouse, you can swiftly move forward and backward, choose any individual volumes, sections and entries.

It's a lot handier than shelving and reshelving five cubic feet of encyclopedia books. And any of the text

displayed on screen is easily copied to your printer or disk.

We then switched to Search Mode, the real selling point of CD ROM databases. Rolander invited us to ask for any article or reference. We requested "Transylvania." In a few seconds we had a long list of references and were clicking our way alphabetically through articles about Balkan history and geography, the infamous Elizabeth Bathory and good old Vlad Dracula.

The program can also do relational searches. It will seek out as many multiple topics as can be fit into some 500 characters. And you can choose whether you want only those multiple topics mentioned in the same sentence, same paragraph, or simply any article containing the multiple topics.

We asked for a multi-topic search on: German, Submarine. A full screen of references popped up in a flash. As we scanned the alphabetized headings, we were surprised to see an entry for "Hemingway, Ernest."

Unable to resist taking a look, we immediately clicked to Hemingway's biography article and discovered that the great novelist considered himself to be a volunteer anti-submarine watcher during WWII when he lived

in Cuba. This is typical of the kind of unexpected information that Activenture's CD ROM software consistently turns up.

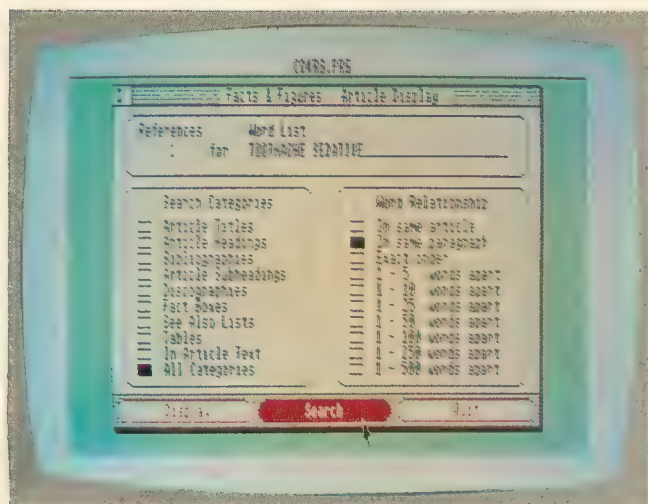
For a search on pioneer psychologist Carl Jung, Rolander selected the Bibliography choice from the search window menu. We instantly saw a screen full of book references, arranged by topics and subtopics. Here is another valuable research tool provided by the Activenture CD ROM software.

We asked Rolander if the software would support "wild card" searches. He said that it could be done, but he was still trying to decide on a wild card system that would be easier for non-programmers than the asterisks and question marks commonly used in computer files for indicating the search's wild characters.

The hardware set-up doing all this was a standard 520ST cabled to a Philips CM100 CD ROM player via a prototype controller box. When the product is released, the controller interface circuitry will be reduced to a board inside the disk player.

Atari plans to contract with one of the major CD ROM manufacturers to make a disk player for sale under the Atari name. At this writing, Philips was the front-runner for the deal. The

- SEARCH MODE -



disk mastering for Facts and Figures has been done by Philips in Holland. The first CD ROM mastering facility in North America was due to be opened by 3M this fall.

HOW COMPATIBLE?

We started by bringing up our questions about CD hardware. How different is CD ROM from standard digital audio disk technology? Could you use CD ROM on any compact disk player?

"No, it's not 100% compatible with digital audio. But the idea is to keep down CD ROM costs by using as much as possible of the CD audio technology," said Rolander. "And there is a universal CD ROM standard that has been accepted by Philips, Sony, Hitachi and all the other major manufacturers involved in the field. So there won't be any problems with competing formats."

Similarities between CD ROM and CD audio include the same 4.75-inch disk size, with identical mastering and duplicating processes. This keeps expenses low. It costs no more than \$4,000 to make a master disk for pressing. The cost for pressing 1,000 disks is \$4 apiece.

All CD players share the same principles of laser optics, the same motor

and drive specifications. However, CD ROM requires greater precision in mechanically positioning the laser head and mirror.

Also, CD ROM needs a higher degree of error correction accuracy. It uses 10 to the minus 12th power—meaning you might get a typographical error once in a trillion times. This is accomplished by adding 288 bytes of error correction code onto every data "block" of 2,048 bytes. An unformatted CD ROM disk could actually store 600 megabytes.

"CD ROM needs these more precise tolerances because you cannot have the two-or-three bit error factor that's acceptable for compact disk audio reproduction," said Rolander. Accordingly, he wouldn't be surprised if top-of-the-line CD ROM players also include audio disk capability in the near future.

WHAT'S ON TAPE

"Any text that's stored on magnetic tape can be machine read and automatically indexed by our software," said Rolander. This immediately made us ask how much reference material was now available on magnetic tape.

His answer was that just about all printed matter of any substance that has been published within the past

five years could be found on tape. That's because the largest state-of-the-art typesetting machines, such as the Compugraphic 8600 and the top-line Mergenthaler model, normally keep the text data on electronic tape.

"Also there are the huge libraries of information already processed electronically for online databases," Rolander added. "A surprising amount of this material is in public domain, often because it has been prepared by the government."

Rolander predicts that CD ROM will soon replace microfiche film storage of documents. Activenture has already been contacted by a U.S. intelligence agency about the possibility of converting vast libraries of raw information into CD ROM databases.

CD ROM SOFTWARE

To get a better idea of how Activenture's software is set up to access massive amounts of data so rapidly, Rolander took us into Activenture's development room.

We walked up two stairs onto the raised floor of an air-conditioned computer center and saw an array of state-of-the-art computer hardware. The heart of the system was a VAX 11/750 super-minicomputer with 8

continued on next page

megabytes of main memory and 1500 megabyte disk drives.

Across the aisle from the VAX was the video equipment, featuring a Sony professional broadcasting one-inch tape deck. A complete video editing system worked off the Sony, including a character generator, special effects and digitizing consoles and a camera stand.

This video set-up has been used for establishing that it's technologically possible to incorporate digitized illustrations into the Facts and Figures database text. However, the first encyclopedia release will not include illustrations.

"For one thing, processing the pictures is very labor-intensive," Rolander explained. "We could fit 13,000 illustrations onto the current encyclopedia disk, at 32K memory per illustration. But that would mean somebody has to place 13,000 pictures on the camera stand and operate the recording controls each time."

But that wasn't all. "Up to now, the encyclopedia companies normally own only a small percentage of the illustrations they print. The rest are leased from archives for one-time use. Activenture does not presently have the resources to negotiate rights for thousands of pictures. However, I'm sure it won't be long before fully illustrated CD ROM databases are marketed."

Rolander sees Activenture as an "optical typesetter." Paid by royalty fees, Activenture offers the service of creating a fast, interactive index for existing reference material and databases. When Rolander isn't hurrying to finalize his software in time for Atari's September deadline, he's flying East to meet with traditional publishers and sew up more CD ROM rights.

HOW IT'S DONE

The CD ROM disk has four different sections. First is the raw data—which is nothing more than all of the encyclopedia, from A to Z. Then comes the index, or table, which contains pointers to all unique words in the encyclopedia. Next is the directory, which is similar to the file management sectors of a floppy disk. It tells the program where to find a file on

the disk.

Finally, there is the Facts and Figures software, which loads into the computer and runs the show. At this writing, Rolander was uncertain whether this section would be on the CD ROM or on a separate floppy disk. It depended on whether Atari made the CD ROM Player a self-booting peripheral.

All the Activenture CD ROM software was programmed entirely in the C language. After Rolander wrote his minicomputer indexing program, it took the VAX no more than six hours to read the approximately 58 million characters in the Grolier Encyclopedia and create the index table.

The program counted the number of unique words at just around 141,000. Some 30 "stop words"—including but, a, and, of, the, etc.—were ignored in the index.

At the same time, the unique words were also alphabetized and every one of their locations in the encyclopedia was mapped. One reason for the lightning speed of the Facts and Figures software is that it searches references in the index, not in the encyclopedia.

Interestingly, the fully mapped index takes up 50 megabytes, almost as long as the 58 megabytes of the encyclopedia itself. However, the entire encyclopedia and index only require one-fifth of a standard compact disk!

The encyclopedia text files must be usable with video monitors that have different resolution formats. So the software formats the text in real time as it is going into display.

"To keep the program moving fast, it calls up very large buffers," said Rolander. "In fact, it will use whatever free memory is available." The storage buffer requires a minimum of 64K, and the Facts and Figures software will also need its own 64K of RAM.

Transfer rate of the CD ROM is 150 kilobytes per second. An important design element of the ST, to speed this huge data transfer, is the DMA (Direct Memory Access) chip. And it's no accident the ST has this capability. Rolander and Atari ST hardware designer, Shiraz Shivji, worked closely together, once it was decided the ST would have CD ROM as a peripheral.

CD FILE FORMAT

The format of a standard floppy disk consists of tracks in concentric rings, each consisting of a number of sectors. Optical laser disks have two standard formats: CAV (Constant Angular Velocity) and CLV (Constant Linear Velocity).

CAV is similar to floppy disk formats. The tracks are concentric rings, each containing a number of sectors—except the sectors are called "frames" or "blocks." The CAV format wastes a great deal of space. The outside tracks are longer, but they contain the same number of blocks as the shorter inside tracks. However, CAV is easier to program for read-write access, and some laser video players use this method because it permits "freeze-frame."

CLV is a spiral format, much like a phonograph record. All the blocks in CLV are equidistant along one long spiral. So there are three times as many blocks per track at the outer edge as there are towards the center. The CD ROM's 540 megabytes in CLV format are divided into 270,000 blocks, with 2,048 bytes in each block. CLV is the format of CD audio and some video players. Rolander chose the CLV format for his CD ROM system because it permits far more storage.

AND THE FUTURE

Personally we can't wait until something like the microfilm library of the "New York Times" becomes available on CD ROM so that we can browse among odd and obscure facts to our heart's content.

At the same time, we have told our typesetter (the same one since **Antic** began) never to erase any of the magazine's floppy disk files from now on. It would not be a bad idea to bring out a CD ROM disk containing every issue of **Antic**. All topics and all listings ever printed in the magazine would be instantly accessible via the CD ROM database.

And while we are at it, we might as well include every program in the **Antic** public domain library on the same disk. . .



VIP Professional™

For Your Atari ST™

Identical to Lotus 1-2-3™

Except for the Price: \$99.95

The universal dream - to have 1-2-3 power on your Atari ST - has come true. VIP Professional is a program identical in features and commands with 1-2-3. The same spreadsheet analysis, information management and extraordinary business graphics. All combined in one easy-to-learn, easy-to-afford package. What's more, VIP Professional not only has all the features of 1-2-3, you can also type the same keys to do the same things. Or better yet, use a mouse to make it all so much simpler.

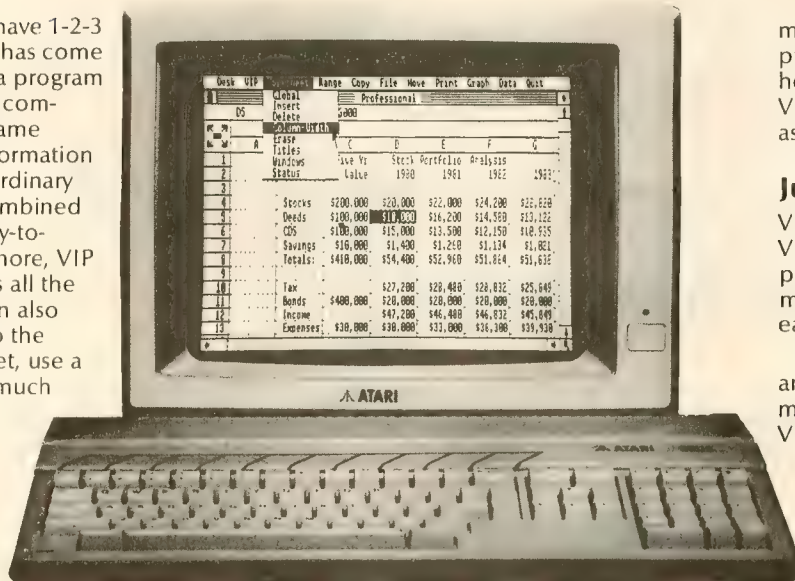
Not Just 1-2-3 in Mouse Clothing

VIP Professional is totally faithful to the 1-2-3 standard. In fact, you can use "1-2-3" files created with Professional with 1-2-3 itself, or with versions of Professional on the Apple II, the Macintosh, the Commodore Amiga, IBM's, even UNIX computers. But like the ST itself, Professional also has the spirit of a daring maverick. Just as the ST outstrips the power and performance of the business computers, VIP Professional meets and out-features Lotus. Compare for yourself:

Feature	VIP	1-2-3
123 Commands	Yes	Yes
123 Graphics	Yes	Yes
123 Database	Yes	Yes
123 Macros	Yes	Yes
123 Files	Yes	Yes
Enhanced Graphs	Yes	No
Uses mouse	Yes	No
Drop-Down Menus	Yes	No
Icons	Yes	No
GEM interface	Yes	No
Multiple windows	Yes	No
Available on ST	Yes	No
Easy to use	Yes	No
Affordable	Yes	No

A New Gem™

VIP Professional is easy to use because it takes advantage of the GEM environment and other elegant features built into the ST. Throw in lots of help, a thoughtful tutorial for the novice, and a thorough reference manual, and you have the



makings of the perfect powerhouse product for the office, school and home. And at the super low price, VIP Professional is as easy to afford as it is to use.

Just a Hint of Things to Come

VIP Technologies is on the move. VIP Professional is the first of several products for your ST under development, all of which will interact with each other. Expect to see soon:

VIP Analysis™—A statistical and analytical tool to integrate and manage information created with VIP Professional or Lotus 1-2-3.

VIP Freelance™—A complete text processor with full formatting capabilities, plus a complete workbook of writer's tools.

VIP Consultant™—A project management program to help design, organize and implement any complex task at hand.

VIP Forethought™—An outline processor useful for organizing any mental activity.

Our software will make your ST investment one of the best you have ever made.

Although VIP Professional will sell for \$149.95 after November 1, as a special introductory offer, you can get this product now for the low price of:

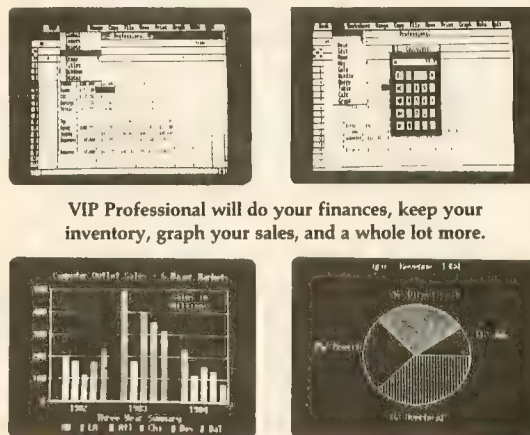
 **\$99.95** 

If Your Dealer is Out of Stock, Order Direct.

1-800-328-2737

In California call:
1-800-468-8737

Order Status and Software Questions:
(805) 968-4364



VIP Professional will do your finances, keep your inventory, graph your sales, and a whole lot more.

VIP

Technologies

132 Aero Camino, Santa Barbara, CA 93117

VIP Professional, VIP Analysis, VIP Freelance, VIP Consultant and VIP Forethought are trademarks of VIP Technologies; ATARI and ST are trademarks of Atari Corporation; GEM is a trademark of Digital Research, Inc.; Lotus 1-2-3 is a trademark of Lotus Development Corporation.

© 1985 By VIP Technologies

Mail orders: For shipping and handling add \$3 in the U.S. (\$6 Canada; \$20 overseas). California residents add 6% sales tax. COD's and Purchase Orders WILL NOT be accepted. Personal checks will be held for three weeks to clear. All prices are subject to change without notice.

Software Submissions Encouraged

GEM COLOR CASCADE

How to convert an 8-bit Atari program for the ST

by PATRICK BASS, *Antic* ST Program Editor

In May, 1985 I wrote a letter to the Editors of *Antic* asking if I could perhaps write an article or three for them. I mentioned that I had been a game designer/programmer for the old Atari during its heyday, and that later I programmed games for two Silicon Valley start-up companies that didn't quite "start up."

So one Thursday when I'd just gotten home from being told I was over-qualified to deliver pizzas, my father told me *Antic* phoned and wanted me to come up to San Francisco and see the editors. The next morning I hopped onto my Yamaha 250 motorcycle and hit the freeway. Shortly before noon, *Antic* sat me down at a 520ST and wouldn't let me leave.

I was in hog heaven when *Antic* hired me to learn how to program their development ST. I had already decided to buy a 520ST when it became available, my only problem was figuring out how to afford one.

The pile of highly technical documentation that came with *Antic's* 520ST was almost three feet high. I took home as much as I could carry and spent the weekend reading it.

Back at *Antic* on Monday morning I confidently expected to start writing my first 520ST program using 68000 machine language, which I'm familiar with. However, the ST had other ideas.

For one whole day I was stuck at one seemingly innocent statement (.ORG or Originate) that told the computer where to start putting my program into memory. The 520ST absolutely would not get past this.

After what seemed like a couple of eternities I finally figured out that I was mistakenly assuming the 520ST acts like a microcomputer. In fact it acts much more like a minicomputer.

The ST operating system is essentially Digital Research's CP/M 68K, which is a multi-tasking system that

can run more than one program at the same time. If two or more programs tried to occupy the same memory address at the same time, the computer would fail.

Therefore every application program written for the ST must be completely relocatable, able to run from any address. This is not really so strange. Any interpreted BASIC program on any computer is completely relocatable, it's constantly being shifted up and down in memory as you add or delete lines to your program.

COLOR SINEWAVE

It took another two weeks of solving more mysteries like "The Riddle of the Crashing .ORG Statement" before I was actually ready to get a program up and running on the 520ST. . .

I had never programmed in C before I sat down at the ST. And I was

happy to discover it's possible to write programs in C that look very much like BASIC. To demonstrate this, I'll explain how I wrote a program that does the same thing in C on a 520ST and in BASIC on any 8-bit Atari computer.

A simple program that I've used many times creates an impressive graphic display. It plots a sine wave from left to right and a cosine wave from right to left. Then each time it plots a pair of sine and cosine dots, it draws a line between them. The result is a pattern of lines that cascades differently across the screen each time.

BASIC COLOR SINE

It's safe to assume that more **Antic** readers can program in BASIC than in C. So let's get started by examining the BASIC program for 8-bit Atari line by line.

Line 100 opens a channel to the keyboard and line 110 sets the X, Y screen limits of Graphics Mode 8.

Line 120 creates an endless loop. If you program a loop in BASIC with a STEP size of zero, that loop will never end. Since we have a beginning value of zero and an exit value of one, the loop will never reach one until we reset LOOP to a value higher than one. This is as close as we can get to a REPEAT...UNTIL construct in Atari BASIC.

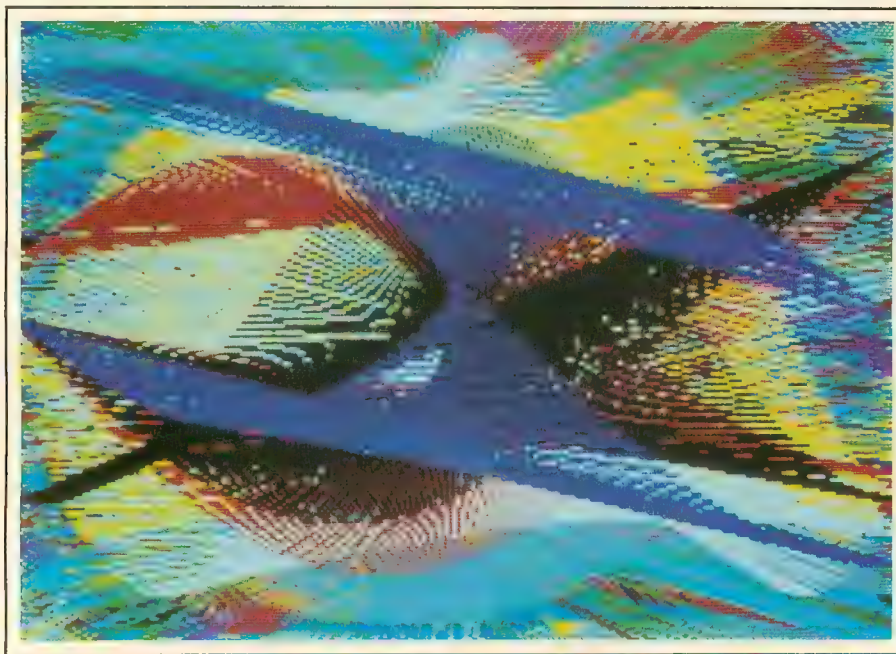
Lines 130-140 set the graphics mode and set the background and border colors to black.

Lines 150-160 select a random number between 10 and 80 for the AMPLITUDE (height) of the wave.

Lines 170-180 select random numbers between 5 and 75 for the PERIOD of the wave. The period of a sine or cosine function determines how many times the value returned

from sine or cosine will cycle within a given space. The smaller the number, the more "hills and valleys."

Line 190 places a random value between 1 and 6 into the variable SIZE.



Line 200 uses SIZE as a STEP value in a FOR/NEXT loop which determines the number of X points to be plotted along the X axis.

Line 210 figures the first Y axis point. Look at it as BASIC would, beginning from the innermost set of parentheses. XPOINT and SINEPERIOD might typically hold values of 110 and 30 which result in 3.66 when divided. BASIC will then calculate the SIN of the result, which will yield -0.5012.

This is then multiplied by SINEAMPLITUDE, (typically around 50) giving an answer of -25.06. Since sine and cosine values may range below zero, and BASIC cannot PLOT negative values, we add half the screen height (YRES/2) in order to shift the dot about halfway down the screen.

Line 220 performs the same action as 210 for the cosine value.

Line 230 PLOTs the first pair of points, using XPOINT and SINEY, and DRAWs a line TO the right side of the screen minus XPOINT and COSINEY.

Line 240 checks to see if a key has been pressed while the computer was figuring and drawing the line. If so, it cleanly finishes the loop by setting the XPOINT counter to its highest ex-

pected value, which line 250 awaits to finish its drawing loop.

Line 250 completes the logic of the drawing loop.

Line 260 places the value of any key pressed during the loop into KEYPRESS. Line 270 then checks to see if the character pressed was an X. If so, the value for the LOOP counter is set greater than its exit value and we leave loop—and the program.

GEM COLOR SINE

Now that we've gone through the BASIC program, let's take a look at how it works in

the C listing, step by step. If you are unfamiliar with C, you should first read our sidebar—C at a Glance.

The first two lines of the C listing are comment lines bracketed between /* and */. The next five lines cause the C compiler to #include files containing previously typed definitions that may be used throughout the program. You may use or ignore these definitions as you see fit.

The whole next block of code—down to, but not including main()—is our declaration of the variables and arrays to be used by the program. The first two lines are required by GEM and provide a way to send GEM control and input parameters, while GEM sends back parameters as answers or limitations.

The rest of the int's are 16-bit variables which we chose for the program. There are also two doubles because these variables will be required to hold values greater than 16 bits.

extern double means that these are routines already saved on another disk file which we will link in our program during compilation. Think of these routines as pre-written functions.

continued on next page

Since our program is small, it will all be contained within the **main()** function. All functions called within **main()** will be provided by either the C library, or whichever files are included or linked at compilation time. Most of the functions will be GEM calls.

THE MAIN

Now that we've taken care of all the declarations, let's look at our **main()** program, step by step.

The first thing you see is a left curly bracket (brace). This means "begin." At the bottom of the program, you will find the right brace which means "end." But within the program are more braces containing the beginning and ending of logical routines

Our first actual program statement is **appl_init();**. We can see that it's a complete statement since it ends with a semicolon. **appl_init()** is a routine that prepares GEM to receive information from our application.

Following this is **handle=graf_handle(&dummy, &dummy, &dummy, &dummy);**. Since GEM can have more than one screen window open at any time, we need a way to keep track of which window we want.

When we make this call, GEM assigns a number to the new window and stores it in the variable we have chosen to call "handle."

GEM returns additional information from the **graf_handle** call—such as the X,Y co-ordinate of the upper left corner of our window. Our program doesn't use this information, but we need to provide parameters (**&dummy**) for GEM to store the data.

C "FOR" LOOP

Now we get to a statement which is very similar to a BASIC FOR/NEXT loop. The elements are: FOR (entry condition of loop; condition to be satisfied for the loop to continue; STEP value for loop). In BASIC this would be: FOR I=0 TO 9 STEP 1: NEXT I.

In C the loop says: for (i starts at zero; continue as long as i is less than 10; use i, then increment it). The last

part could also have been written as **i=i+1**, or, more cryptically, **i+=1**.

The instruction executed within the loop is contained between the braces. This loop fills an array called **l_intin** with information such as line style, color, and character size. This data is needed by GEM prior to opening the graphics window.

The next statement is **v_opnvwk(l_intin, &handle, l_out);** similar to a GRAPHICS call from BASIC. **l_intin** is the list of parameters passed to GEM that we prepared above. **&handle** means: "give the address of the handle to GEM", and **l_out** is an array that GEM returns describing things like screen size and number of colors. We can later access these values if and when we need them.

For example, right below we use three of those values. **xres** is how wide the screen is, **yres** is how high the screen is and **max_color** is how many colors we can work with on the device opened. By using these variables, instead of constants, we can be assured our program will work in all video resolutions.

Now, we encounter a FOR loop which directly corresponds to the FOR loop in the BASIC program that defines our "endless" loop. This line reads: Loop starts at zero. Continue as long as loop is less than one. Each loop add nothing to Loop.

The next DO WHILE construct will choose a color. It reads: DO choose a random number called COLOR between 0 and 15 WHILE COLOR is less than zero OR (the two vertical lines mean OR) COLOR is greater than the maximum number of colors we can show on the screen.

The next line, **vsl_color(handle, color);**, corresponds directly to the COLOR statement in the BASIC program. It selects which color the line will be drawn with next.

The next line selects a random number between one and four for the STEP value in our drawing loop.

The next four DO WHILE constructs will select a random number for the amplitude and period of our sine and cosine values in the drawing loop.

DRAWING LOOP

Now we enter the drawing loop itself, which uses the variable **iter** as a counter across the screen.

We indent again to show we are in another loop.

Next we set **xpoint**, a double precision variable, equal to the value of **iter** so we can perform floating point math on it.

The next two pairs of lines will figure the values needed for our two line endpoints. The GEM call that draws a line is called **v_pline()**, but before we call it we need to figure in advance which X,Y points the routine will draw to. Then we place them as elements in an array variable which will become one of the parameters in the GEM call. We could specify more than just one pair of points if we needed to.

V_PLINE

We now come to the nucleus of the program: **v_pline()**. This call reads: "GEM, draw a polyline inside window 'handle'. The line has two points and the X, Y coordinates for the line are in an array called 'ptsin'."

v_pline() is very much like the BASIC USR calls which are in *Antic's* GUP program (June, 1985). You establish your parameters and variables, then place them in the parentheses and make the call. GEM does the rest.

The matching brace which ends our drawing loop FOR construct acts the same as NEXT in BASIC.

ENDLESS LOOPING

We now come to a DO WHILE construct that creates an endless loop. The GEM call **vq_key_s()** will cause GEM to put the value of Shift/Alternate/Control keys in a variable called **key_state**.

It will continue to do this as long as **key_state** is equal to zero, which means no keys are pressed. (The **==** means "test for equality" and is different from a single **=**, which means "is assigned the value of.")

The IF statement causes the loop to exit by comparing the **key_state**

value to eight—the value of the Alternate key. When the Alternate key is pressed, **key-state** is set to eight and the value for our “endless” loop counter is incremented, causing the exit of the loop.

If the alternate was pressed, we fall down to the **v_clsvwk(handle)** call, which will free the space GEM

set aside for our workstation.

Then we come to the **appl_exit()**; call, in which we “un-hook” our application from GEM, and free the memory used for other applications.

The last line is the brace that ends our **main()** function.

We hope this detailed take-apart gives you some idea of how GEM is

implemented in the Atari ST. Many of you have never used C, so you may have to struggle a bit. Again, take a look at GUP in our June, 1985 issue. GUP is very similar in concept to the GEM calls. The main difference is that GEM uses the elements within arrays and the arrays utilized as parameter elements in the calls.

Listing on page 66.

C AT A GLANCE

C is a compiled language, like assembly language. This means the original program is written on a text editor and saved in a file called the “source” code. This source code is compiled (translated) into machine or “object” code.

C source code contains no line numbers. The compiler uses spaces as delimiters between the recognizable symbols. Therefore it ignores spaces and carriage returns. For this reason, you can write C source code in any format you please. However, over the years certain standards in C formatting have developed.

By custom, C code is written in lower-case letters, although it usually doesn't matter to the compiler. Indentation is an important element in C readability. Nested loops, for example, are indented.

NO LINE NUMBERS

Since there are no line numbers, the compiler recognizes the semicolon (;) to separate logical lines or statements. Similarly, there are structures—such as the BASIC FOR/NEXT loop, or the ACTION! DO...OD structure—which require a delimiter that does not even appear on the Atari 8-bit keyboard. This is the curly bracket “{”. Left curly bracket means “begin” and right curly bracket, “}” means “end.”

DECLARING

In Atari BASIC, all strings or array variables must be DIMensioned so that BASIC knows how much room in memory to reserve for them. In C, all variables must be “declared.”

This is necessary because C variables can take up different amounts

of memory, depending on their data type. Declared variables can be a “char” (8 bits), “int” (16 bits), or “double.” (32 bits).

Let's take a quick look at the overall structure of a C program, and then we'll list some books which can really give you the details.

C programs are made up of a group of subroutines called “functions.” Functions may be written by the user, provided by the C compiler, or provided by other files called “libraries.” These library files are merged with the code during compilation.

BASIC programmers may think of functions as **USR** calls. Parameters may or may not be passed to them, and values may or may not be expected in return.

Each function title will contain the name of the function, followed by a pair of parentheses which contain any required parameters. If a value is to be returned by a function, the word “return” followed by parentheses must appear at the end of the function.

MAIN

Every C program must have one function called “main”, which calls the others. A small C program may contain only the main function. To follow a C listing, first look within the main function, which will act as a “table of contents” of the other functions.

Since C functions may come from the language, or the user, or the library files, it becomes a matter of experience to differentiate between those function titles reserved by the language and libraries, and those created by the programmer. In the

specific case of the Atari ST GEM libraries, any function beginning with the letter “v” will be part of a GEM VDI call.

C BIBLIOGRAPHY

THE C PROGRAMMING LANGUAGE

by Brian W. Kernighan and Dennis M. Ritchie
Prentice-Hall Software Series
Englewood Cliffs, NJ 07632
228 pages, paperbound
\$24.50

SUREFIRE PROGRAMMING IN C

by Warren A. Stewart
TAB Books, Inc.
Blue Ridge Summit, PA 17214
270 pages, paperbound
\$16.95

THE C PROGRAMMING TUTOR

by Leon A. Wortman and Thomas O. Sidebottom
Robert J. Brady Co.
(Prentice-Hall)
Bowie, MD 20715
274 pages, paperbound
\$19.95

UNDERSTANDING C

by Bruce H. Hunter
SYBEX, Inc.
2344 Sixth Street
Berkeley, CA 94710
320 pages, paperbound
\$17.95

LEARNING TO PROGRAM IN C

by Thomas Plum
Prentice-Hall, Inc.
Englewood Cliffs, NJ 07632
230 pages, hardcover
\$32.95

Listing on page 66.



FIRST ST PERFORMANCE TEST

Mac eats the ST's dust

by PATRICK BASS, *Antic* ST Program Editor

Perhaps it's in our blood. . .

Seems as if people just *need* to rate and compare things to see which is the fastest or most powerful. This certainly holds true when it comes to rating different computers against each other.

One standard that's used for com-

paring computer performances is speed of program execution. The same program, in the same language, is run on different computers.

Since 1981, Byte Magazine's "Prime Number Benchmark" has been the most widely accepted test of computer speed. This benchmark pro-

gram is a simple procedure for finding all the prime numbers between 3 and 16,381. It adapts the Sieve of Eratosthenes, which has been around since the third century B.C.

THE SIEVE

How does the Atari 520ST stack up?

Figure 1

Computer	Operating System	Language	Run Time (Sec.)
68000 Atari 520ST	TOS	C Digital CP/M 68K	3.8
68000 Apple Macintosh	—	C Manx	7
68000 Apple Macintosh	—	C Hippo L2	13
Z8001 5.5 MHz	Unix	C	1.97
Z8000 Z-Lab	Zeus Unix	C	4.8
Z80	CP/M	Digital BASIC	15.7
Z80	CP/M	MicroSoft COBOL	5115
6502 Atari 800	OS Rev.B	ACTION! display off:	12.2
		display on:	17.9
6502 Atari 800	OS Rev.B	BASIC	389
6502 Atari 800	OS Rev.B	BASIC XL	214

Antic thanks Craig LaGrow of Computer Language magazine for providing comparative C run times, and Bill Wilkinson of Optimized Software Systems for the Atari 8-bit language run times.

We typed the "Prime Number Benchmark" into our 520ST using C language and timed how long it took to run.

The 520ST turned in a time of 3.8 seconds. This speed puts it right up there with minicomputers running the UNIX operating system! (See *Figure 1.*) A Z8000 Z-Lab Zeus UNIX minicomputer running C took 4.8 seconds, and a Z8001 5.5 MHz mini running C on UNIX took 1.97 seconds.

At the low end of the scale, microcomputers running the benchmark took from 15.7 seconds (Digital BASIC on a Z80 microprocessor) to an astounding 5115 seconds (1 hour, 25 minutes) on a CP/M Z80 running COBOL.

ST VS. MAC

The Macintosh is the closest relative of the Atari 520ST because both machines use the 68000 microprocessor. Fastest Macintosh time for running the Sieve program in C was 7 seconds and the slowest was 13 seconds. The 520ST left Mac in the dust!

Note that this test does not depend on any I/O devices. Some computers might run a program blindingly fast, and then take the rest of the afternoon to write the results to disk. Other computers might take longer with the same program but write to disk quicker, thus completing the entire task in less time.

Suppose we had selected a benchmark test that included sorting a number of disk files. The speed of the disk drive hardware and software could be as important as the actual speed of the computer. Printers also tend to slow computers down a lot. An Atari 520ST can execute more than 10 million instructions in the time it takes a printer to perform a carriage return!

We can also speed up the way a benchmark program performs its job. One common technique for doing this is to take advantage of special hardware features found on your particular computer. A familiar example for Atari 8-bit computer users would be to turn off the screen and speed up the program by 30 percent.

MERE TWO MILLION?

Just how fast is fast, anyway? Sometimes it seems funny to praise one computer for performing 8 million operations per second and then scorn another computer that *merely* performs 2 million operations per second. How long would 2 million operations take you with a pencil and paper?

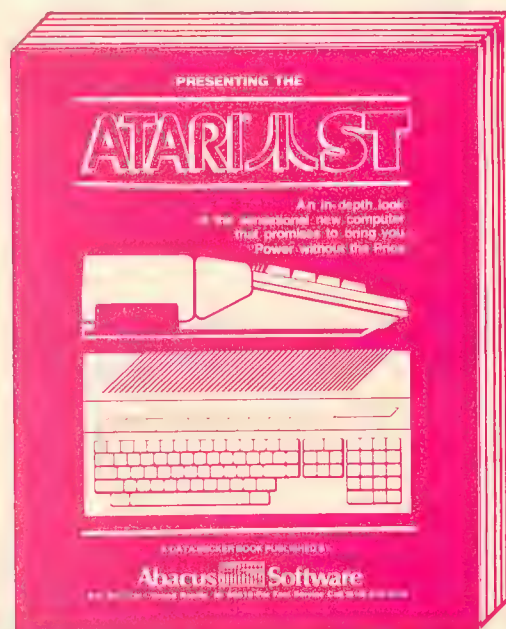


"Jackintosh"

We wrote the book

First there was the fabulously successful VIC-20. Then came the record breaking Commodore-64. Now Jack Tramiel has lauched his third home computer.

The ATARI ST promises to shatter all existing price-performance barriers to become a leader in the home computer market.



This book, **PRESENTING THE ATARI ST**, gives you an in-depth look at this sensational computer that promises to bring you... "Power without the price." Some of the topics include •history of Atari •overview of the ST •components and operating system •peripherals •languages •user programs and more. **Price \$16.95**

Call for the name of your nearest dealer.
Other books coming soon!

For fast service call 616/241-5510

Abacus  Software

P.O. Box 7211 Grand Rapids, MI 49510
Phone 616/241-5510 Telex 709-101

ST PRODUCT NEWS

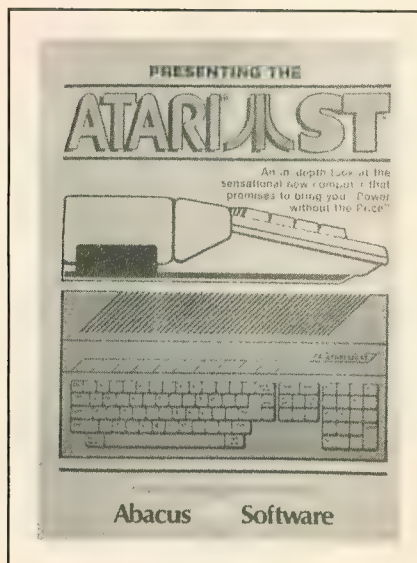
First ST review

Reviewed by Jack Powell

Presenting the Atari ST has the distinction of being the first ST product to arrive at the **Antic** offices. It showed up here on Tuesday afternoon, May 28 and we were all pretty amazed. The computer was not in general release, and we had just plugged a newly revised operating system into our development 520ST. Yet here was a book about it!

So what do we have here? Well, the frontispiece showed this is a translation of a book published in Dusseldorf, West Germany. (We have a copy of the original that was brought back from the Hanover Electronics Fair. But we were unable to find any German-reading Atarians to help us do something with it.) Presumably the authors had a head-start, since the ST was released first in Canada and Europe.

Eagerly tearing into the English version, we found a compilation of information previously available about specific parts of the machine—but



PRESENTING THE ATARI ST
Abacus Software
P.O. Box 7211
Grand Rapids, MI 49510
(616) 241-5510
\$16.95

probably not available from Atari. Much of this information is not always specific to the ST, but it's still handy to have everything in one place.

The book starts with a brief description of the evolution of the 16-bit processor, then focuses on the Motorola MC68000, which is the heart of the Atari ST.

This leads to an overview of 68000 assembly language, including a list of the instruction set, diagrams of the registers, and some examples of the addressing modes. The whole section is presented at an introductory level. Although none of it will teach you 68000 machine language, it does offer an idea of what is in store if you pursue the subject further.

Unfortunately, the authors provide no bibliography of outside reference material to guide the reader.

Presenting the Atari ST then concentrates on peripherals, beginning with a very informative block diagram of the relationship between

the CPU, the special chips, the ports, and the peripherals. It spends a couple of pages on each of the peripherals and chips.

The book is an odd mixture of highly technical, but sketchy, hardware-specific information, followed by elementary material. An entire chapter is devoted to Logo. It takes up space, but does not really tell enough for a practical tutorial.


Another section has a diagram of the pin-outs of the 68000. This could be informative, but the authors don't follow through with a discussion of what it means.

There are several inaccuracies because the authors made assumptions based on incomplete or out-moded information. For example, they had no way of knowing that the 520ST's GEM would first be released on disk. So they refer to it as being in ROM.

One section gives a very clear explanation of how BDOS and BIOS works, and then goes on to list BDOS and BIOS function numbers in CPM/68K—which we now know are not the same numbers as in TOS (Tramiel Operating System).

Nevertheless, Presenting the Atari

ST gives a clear overview of the new machine, and is fairly accurate, considering the limited information available at publication time. Predictably, there is a certain amount of padding, but most prospective ST buyers will still be happy to get their hands on it.

Antic congratulates the authors for accomplishing so much, so quickly. The publishers tell us they plan four more books on the ST before the end of the year. No doubt these will provide much more detail. We look forward to adding them to our Atari ST library. 

Under development

Flash! Just as we went into print, **Antic** received the completed **4xFORTH**, an 83 Standard Forth from the Dragon Group. It's available right now at \$99.95 retail. And it's fast—twice as fast as MacForth. It's also capable of multi-tasking and multi-user functions on the ST. This is probably a first for any microcomputer. Look for an in-depth review in the ST Section soon.

Atari has been busily working with developers. They assigned Arrakis Technology to produce a disk tutorial for the new machines and some dealer demos.

Atari is also working with Mosaic Software to transfer their successful Lotus 1-2-3 clone, **Twin**, to the ST. On the IBM version, Twin can read Lotus 1-2-3 files. On the ST, Twin will retail for \$99 and will be available in the fall.

Meanwhile, there should be no

shortage of quality languages for the ST. Philon, Inc., a leading developer of language compilers for M68000-based minicomputers, announced plans to produce all their compilers for the ST. Philon currently has compilers in C, BASIC-C, BASIC-M, COBOL, FORTRAN, and PASCAL. The first compilers available for the ST will be BASIC-M and BASIC-C at \$79 each, followed by C at \$149.


ERRATA: Last month, we mistakenly reported that Sublogic would be producing **Financial Cookbook** for the ST. We should have said Electronics Arts is transferring this program to the new Atari. Sorry, EA.

4xFORTH
Dragon Group
148 Poca Fork Road
Elkview, WV 25071
(304) 965-5517

ARRAKIS TECHNOLOGY
(Tutorials & Demos)
1425 Dorchester Blvd. West, #400
Montreal, Quebec
Canada H3G 1T7
(514) 875-5477

FINANCIAL COOKBOOK
Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171

TWIN
Mosaic Software
1972 Massachusetts Ave.
Cambridge, MA 02140
(617) 491-2434

PHILON, INC.
(Compiler Series)
641 Avenue of the Americas
New York, NY 10011
(212) 807-0303 



BANJO PICKER

Play bluegrass music like
a bionic Earl Scruggs!

by RICHARD K. LINDGREN

Program your Atari to make sounds like an automated five-string banjo. Then just press two keys and you'll be strumming bluegrass rhythms like a bionic Earl Scruggs. Banjo Picker is a BASIC program that works on all Atari computers of any memory size.

Even if your manual dexterity is so bad that you can barely type with two fingers at a time, your Atari and the Banjo Picker program will enable you to pick fancy banjo chords at a speed and accuracy rivaling Earl Scruggs . . . or at least Steve Martin.

All you need to do is type in Listing 1, check it with TYPO II, and SAVE it.

WHAT IT DOES

Banjo Picker uses the Atari's four sound generators to simulate the style of a five-string banjo. Each string in the sequence starts out at high volume, then reduces volume by steps as the successive strings are played. By the time the fifth string in the sequence is played, the first has reached zero volume level, and can be sounded again.

The program can play 11 different 8-note patterns for 13 chords. When you RUN Banjo Picker, you'll see the current chord and pattern numbers displayed at the top of the screen. Below this line, you'll see a diagram of the banjo neck. A bouncing ball follows each string as it is played in sequence.

At the bottom of the screen is a display showing which Atari keys control the chords and picking patterns.

PICKIN' YOUR ATARI

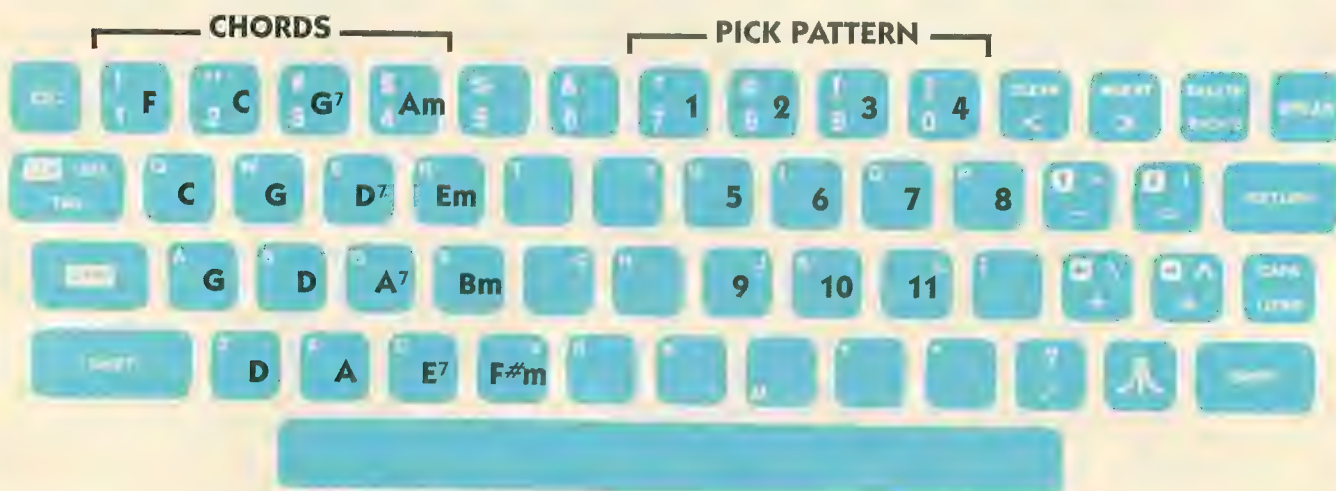
You'll see a helpful diagram of the Banjo Picker operating keys in *Figure 1*.

The chords are arranged in "auto-harp" fashion on the left side of the keyboard, four rows of four keys each. The four related chords in a musical key are found in each row.

For instance, the top row contains the Key of C, with keyboard numbers 1 through 4 controlling the subdominant chord (F), the tonic (C), the dominant seventh (G7), and the relative minor (Am), respectively.

continued on page 30

Figure 1



F-15 STRIKE EAGLE



MAJOR BILL

**Hold Onto Your Helmet –
This F-15 Is For Real!**

"You'll get all the sophistication and thrills of an actual fighter mission. Take it from a jet fighter pilot – this simulation will keep you excited for a long time."

CESSNA and MICRO PROSE
present the

Great American

**LEARN TO FLY A REAL AIRPLANE
Contest**

**\$30 OFF COUPON AND
FREE FLYING LESSONS!!!**

You get a coupon worth up to \$30 towards a Cessna "Discovery Flight" in every flying simulation product box – Plus you can win a complete flight training course from Cessna. Details in every box, or see your local dealer.

F-15 COMPARISON

Feature	"Real" F-15	F-15 STRIKE EAGLE	Imitation Game
1. Multiple Weapon Systems			
• Cannon	Yes	Yes	Yes
• MK-82 Bombs	Yes	Yes	No
• Air-Air Missiles	Yes	Yes	No
2. Sophisticated Electronics			
• Heads Up Display	Yes	Yes	No
• Radar	Yes	Yes	No
• Electronic Counter Measures	Yes	Yes	No
• Inertial Navigation	Yes	Yes	No
3. Real Combat Missions	Yes	Yes	No
4. Developed and Tested by Real Fighter Pilots	Yes	Yes	No
5. Aerobatic Flying (Loops, Splits, and YoYos)	Yes	Yes	No

F-15 Strike Eagle is available for Commodore 64/128, Apple II and Atari XL/XE computers for a suggested retail of only \$34.95. Also for Macintosh and IBM PC/PC Jr., for a suggested retail of \$39.95. Call or write for more information or MC/VISA orders.

GREAT REVIEWS!

ANTIC – F-15 STRIKE EAGLE

Launch into the most exciting aerial combat since Star Raiders with the F-15 Strike Eagle... F-15 is an engrossing game which challenges pilots of all skill levels..."

Charles Jackson

USA TODAY – F-15 STRIKE EAGLE

"... this is more than the right stuff. Once you've gotten used to flying these banks it will be hard to go back to just cruising from LaGuardia to Logan. F-15 is definitely the only way to fly."

Marc Randolph

ANALOG – F-15 STRIKE EAGLE

"...Don't wait. RUN down to you local software merchant and buy a copy of F-15 Strike Eagle today. Tomorrow may be too late!"

Patrick J. Kelley

RUN – F-15 STRIKE EAGLE

"...The F-15 Strike Eagle is not an arcade game, but, rather, one of the most realistic combat flight simulators I've ever seen. If you're looking for a chance to experience some high adventure and danger in a realistic and challenging format, F-15 Strike Eagle is for you."

Peter Paplaskas

**Experience the Reality
of These Other Great
Simulations from
MICROPROSE!**



MICRO PROSE

SIMULATION • SOFTWARE

120 Lakefront Drive Hunt Valley, Maryland 21030 301-667-1151

COMMODORE 64, ATARI, APPLE, MACINTOSH, and IBM are registered trademarks of Commodore Business Inc., Atari Inc., Apple Computer Inc., and International Business Machines Inc., respectively. Software Speech by Electronic Speech Systems of Berkeley, Ca.



Daring Attack
Helicopter Action
in the AH-64 Apache



Exciting Speech and
Graphic Air Traffic
Control Action!



You are in Command –
D-Day to the
Battle of the Bulge!

The next row contains the corresponding chords for the Key of G, the most popular Key for bluegrass music. The Key of D and Key of A chords are on the two rows below. Three chords (C,G,D) are duplicated on the keyboard in order for the rows to be arranged consistently.

At the right side of the Atari keyboard, the 11 picking patterns are controlled by the 7, 8, 9 and 0 keys in the top row, the U, I, O and P keys in the row below, and the J, K and L keys in the next row down.

Use the [START] key to start and stop playing. Initially, the "G" chord and the first pattern are played. The [OPTION] key speeds up your picking and the [SELECT] key slows it down.

MAKING MUSIC

Hundreds of simple folk-type songs can be played with as few as three adjacent chords. Place the middle finger of your left hand on the W key (the G chord), with the first and third fingers on E and Q, respectively. Bring the playing up to a comfortable speed with the [OPTION] key and try accompanying "Comin' Round the Mountain" using only these three fingers.

Next, try different picking patterns with your right hand and listen for the rhythm. Each pattern has eight notes, so it is best to change as the eighth note is played. When you are trying to change the chord and pattern each time, press the chord key slightly before the pattern key.

PROGRAM TAKE-APART

Lines 60-140 contain the heart of the program. The program sequentially steps through the frequencies represented by the five strings. The banjo's distinctive sound comes from the shortened fifth "drone" string, which usually has a frequency higher than the other strings.

The program rotates these five frequencies through four calls to a machine language routine which quickly POKEs the appropriate SOUND parameters with decreasing volume for each frequency. The pick

pattern determines the order in which the strings are selected, and POKEs a diamond at the appropriate screen location.

Lines 160-250 check for new keyboard selections. The position in array KB corresponding to the internal code of the key pressed contains either a chord number, if positive, a pattern number if negative, or a zero for a "dead" key.

Lines 260-300 handle the special function keys. The speed is decreased by an addition to the delay variable, but increased by halving it, which allows you to quickly get any desired speed.

The initial display is handled in lines 310-370, after which the sound POKE routine and frequency values are read into arrays. Next, the chords and pick patterns are read in, along with the internal code for the corresponding keyboard position.

TUNING YOUR BANJO

In line 580, you can alter the initial chord played (variable P), the initial pick pattern (PP), and the speed (W). Variables C1 through C4, initialized in line 570, control the tone type and volume. The volume fade can be altered by changing these variables, adding 160 to the volume level (0-15) for each sound generator. The total volume should not exceed 32.

The chord data is composed of the internal keyboard code, followed by the appropriate positions in the frequency array (PL) for each of the five strings and the chord name.

These can be changed to create new chords or to place them on different keyboard keys. The key's internal code is not the same as its ASCII code. To find the internal code for any key, use the one-line program below. The code for each key will be displayed as it is pressed.

```
10 PRINT PEEK(764) : GOTO 10
```

Likewise, the pick patterns consist of the keyboard code followed by the numbers of the strings in the eight-note sequence. These patterns and others can be found in **Bluegrass Banjo** by Peter Wernick (Oak Publications, 1974).

KEY VARIABLES

SC(22)	The array containing the scale values for 22 notes.
PK(11,8)	The eleven eight-note picking patterns.
PL(13,5)	The scale values for each string for thirteen chords.
SIMUL\$(16)	The sound poke routine.
A\$(30)	A string for reading and displaying the banjo picture.
CN\$(39)	A string containing 3-character chord names for each chord.
KB(63)	The array which contains the chord or pattern numbers for each keyboard key.
ST1	The screen address next to the string being played.
F1-F4	The current poke values for frequency.
C1-C4	The current poke values for tone and volume.
U	The address of the sound poke routine.
LST	The last key pressed.
P1,P2	Positions in string CN\$ containing the chord name.
W	The speed delay value.
P	The current chord being played.
PP	The current pick pattern.

*Richard K. Lindgren is a CPA and a business professor at Graceland College in Lamoni, Iowa. He is author of a new Antic APX Classic two-program disk, **Real Estate Cash Flow Analysis and Strategic Financial Ratio Analysis**. When finance gets dull, he picks a home-made, left-handed banjo.*

Listing on page 55





'A Paranoid Fantasy' is the author's fitting subtitle for this implacable and intimidating arcade game. Smash the lights, avoid the contagious inmates, snatch every key. But whatever you do, keep moving—or you'll go mad. This BASIC program works on all Atari computers of any memory size, with disk or cassette.

Jack Nicholson didn't have it nearly this tough in "One Flew Over the Cuckoo's Nest."

Tough break, sucker. During your interplanetary travels you were unjustly thrown into an insane asylum. Never mind why. And you better believe this funny-farm isn't like any sanitarium back home on good old Earth. . .

RED OCTOPI

All the other inmates are these octopus-like red aliens who have been pumped full of pacifying drugs. They don't ever do anything except stagger mindlessly like zombies from left to right.

High dosages of those pacifying drugs have produced a truly horrifying side effect in the red-octopus aliens. Yes, you guessed it! An inmate's merest touch is instant death to Earthlings. You lose a life that can only be re-earned with 10,000 points.

Is there no faint glimmer of hope?? C'mon, get serious. Of course you've got one chance in a million. What more would you expect?

The keepers may be sadistic, but they're also lazy and they left the keys lying around! Grab all the keys on the

screen and you can move on to the next screen.

Is there a way to escape the Asylum? Maybe, but we never found it. Probably all you can do is keep alive your sanity and yourself, and hope somebody eventually lets you out.

LIGHTS OF DOOM

To stay sane, you must keep moving. If you stay in one room, you will gradually go mad under the endless glare of the hundreds of Living Lights. These Living Lights move too—from right to left, at a faster pace than the zombie-brained inmates.

Smash out those lights, I tell you.

continued on page 34



LEMONADE

Article by GIGI BISSON

Program by BOB POLARO

Photography Linda Tapscott

Lemonade is a well-known educational simulation that teaches children basic economic concepts. Bob Polaro's excellent Atari version used to be available in the old Atari Program Exchange catalog. Recommended for ages 8 to 12. This BASIC program works on all Atari 8-bit computers of any memory size, with disk or cassette.

Have you ever dreamed about starting your own small business? Lemonade tests your business sense. Your lemonade stand could make you rich. But if your business is a lemon, it could make you bankrupt. And if you go bankrupt, the game's over.

THE SQUEEZE

When life gives you lemons, you can make lemonade. But you might not necessarily make a profit. The object of the Lemonade game is to make lots of money by weighing your lemonade production and advertising costs against anticipated sales.

Your costs vary with supply and demand, inflation, or lemon shortages. Other conditions such as strikes and road construction can also affect your sales. And watch out for rainstorms! As in the real business world, you don't see the effects of these problems until after you've committed your assets.

Does this sound complicated? Actually, Lemonade is very simple to play, but it teaches these complex economic concepts. Playing Lemonade is a little like playing Monopoly—or like an earthbound version of the science-fiction business game M.U.L.E.

Of course, the object is to be a shrewd investor and make lots of bucks. Meanwhile, you'll learn something about the laws of supply and demand, the effects of advertising your business, and the influence of unexpected events on business ventures.

The information is presented in color and there are a few sound effects, but no graphics. Lemonade probably wouldn't hold the attention of young

children very long. But older children will find that making money can be as much fun as zapping space aliens! Teachers can easily use the program to support lesson plans that define terms like "assets" and concepts like "inflation."

HOW TO SUCCEED

You run a lemonade stand. It costs you money to make lemonade and to advertise your stand. The object is to make decisions that will help you earn as much money as possible.

To start your lemonade business, type in the program, check it with **TYPO II**, and **SAVE** a copy before you **RUN** it. **Antic** disk subscribers will find the program under the file name **LEMONADE.BAS**. When you begin the game, you will see a color display telling you it's Day 1.

You begin with \$2 in assets. (Assets are how much money you have to spend.) You use your assets to buy ingredients and make signs. On the first day, it only costs you 2 cents to make

continued on page 34

Flight Simulator II

For
Atari computers
with 48K memory



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include • animated color 3D graphics • day, dusk, and night flying modes • over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available • user-variable weather, from clear blue skies to grey cloudy conditions • complete flight instrumentation • VOR, ILS, ADF, and DME radio equipped • navigation facilities and course plotting • World War I Ace aerial battle game • complete information manual and flight handbook.

See your dealer . . .

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800/637-4983

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

game of the month

ALIEN ASYLUM

continued from page 31

It is your only defense against the encroaching madness. Break a light and you gain one sanity point, leave a light unbroken and you lose one point. If you have 99 sanity points you are perfectly sane. At zero sanity points you are utterly insane and you lose one life.

Displayed at the bottom of the screen are your score, lives, play level, sanity points and number of keys left in the room.

The higher the level, the faster the inmates come at you, and the more keys you must snatch in order to keep going.

Type in Listing 1, ASYLUM.BAS, check it with TYPO II and SAVE a

copy before you RUN it. Now get ready to fight for your sanity.

One way this game provides the illusion that you're going crazy is the diabolical joystick action. There's an inertia routine in lines 200-220. If your joystick isn't moving (LX and LY are both zero) your player continues sliding along in one direction until it either hits a wall, or hits an inmate and dies.

FAKE SCROLL

Asylum uses the time-honored Atari design tool of redefining a character set in Graphics 1. However, there is one unusual technique in the program (which I admit I discovered by accident) that goes a long way towards disguising the low-resolution movement.

In line 390, NF stores a bit pattern (8 bits in a row) consisting of 7 bits off and one bit on. Each time NF is multiplied by two, the bit that's on moves one position. Thus, the smooth movement of all the Living Lights is accomplished by repeatedly POKEing a doubled number into the character—1, 2, 4, 8, 16, 32, 64 and finally 128. This gives the impression of a scrolling movement as the white dots march relentlessly across the screen from right to left.

Spencer Craske lives in Paradise. That is, the town of Paradise in Newfoundland, Canada.

Listing on page 62



bonus game

LEMONADE

continued from page 32

every glass of lemonade, but that won't last for long in these inflationary times!

Some days, you might see special conditions that will affect your business. For example, a Teamsters Strike. This means the truck drivers who deliver your lemons aren't working. So the cost of lemons and the demand for lemonade will go up, and you can charge more.

If Roadwork is displayed, the road will be blocked and customers won't be able to get to your stand. Or, if prices are down, you'll have to advertise more or charge less because demand will be down. If there's a Heat-wave, you're in luck—people will be thirsting for your product.

Now you have to decide how many

glasses of lemonade to make. Type in a number. You can make up to 99 glasses. (If you want only five glasses, type in 05.)

Instantly, "Signs at 15 cents" will pop up. Sometimes the price will change. The more signs you make to advertise your stand, the more lemonade you'll be able to sell. You can make up to nine signs.

"Price/Glass" will appear next. Think about your costs and the conditions and then decide how much to charge. You can charge up to 99 cents a glass. But remember, if you get greedy and charge too much, people might decide to drink the New Coke instead.

Now the computer will ask, "Is this okay?" Type [Y] if it is. If you want to charge a different price, type in [N] and start over. The new numbers will

replace the old ones on screen as you type them in.

The computer will do your accounting and tell you how many glasses you sold and how much money you made.

If life is sweet, keep going until you've made lots of money and become a lemonade tycoon. Of course, if your business goes sour, you might go bankrupt. If that happens, don't get bitter. Just press [START] and try again.

When Bob Polaro was a programmer at Atari, he wrote so much software that people used to jokingly refer to him as "Bob Co." He now runs an educational software programming business, Bob Co., in Santa Cruz, California.

Listing on page 63



ATARI 800 COMPUTERS — \$69.00

RECONDITIONED "IN THE FOAM", NEW LOOKING

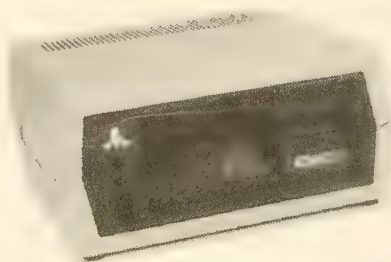
NOT INCLUDING POWER SUPPLY TRANSFORMER (\$15.00 extra)

- ATARIWRITER, complete — \$29.00
- ATARIWRITER, no box or book — \$12.00
- 820 or 822 Printer, *complete* w/cable and paper, no interface needed — \$39.00
- Special Edition Disk Drive made from ATARI® 810 boards, in custom case — \$189.00
- Special Edition Disk Drive with Happy installed (see ad below) — \$339.00
- Happy Enhancement alone — \$189.00
- DE RE ATARI — \$9.95
- 800 Computer 5 board set ROM, RAM, CPU, MOTHER, SIDE — \$39.00
- PAC MAN, no box, clean new cartridge — \$5.00
- BMC Amber Monitor — \$79.00
- BMC Color Monitor — \$199.00
- Cables, Parts — *Call*
- Double Sided Quad Density Disks, box of ten — \$19.00
- 830 Modem — \$19.00
- Touch Type — \$5.00

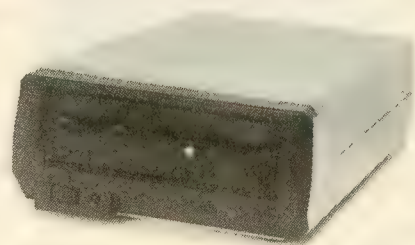
California residents add sales tax
Minimum shipping charge \$5.00

Everything for the ATARI Systems to Parts

SAN JOSE COMPUTER
1844 Almaden Rd. Unit E
San Jose, CA 95125
(408) 723-2025



**YOU CAN'T TELL
A DISK DRIVE
BY ITS COVER!!**



WITH A **HAPPY ENHANCEMENT** INSTALLED THESE ARE
THE MOST POWERFUL DISK DRIVES FOR YOUR ATARI COMPUTER
WARP SPEED SOFTWARE DISK READING AND WRITING 500% FASTER

HAPPY BACKUP — Easy to use backup of even the most heavily protected disks

HAPPY COMPACTOR — Combines 8 disks into 1 disk with a menu

WARP SPEED DOS — Improved Atari DOS 2.0S with WARP SPEED reading & writing

SECTOR COPIER — Whole disk read, write and verify in 105 seconds

1050 ENHANCEMENT — Supports single, 1050 double, and true double density

810 ENHANCEMENT — Supports single density

SPECIAL SUGGESTED RETAIL PRICE: Get the HAPPY ENHANCEMENT 810 or 1050 version with the HAPPY BACKUP PROGRAM, plus the multi drive HAPPY BACKUP PROGRAM, plus the HAPPY COMPACTOR PROGRAM, plus the HAPPY DRIVE DOS, plus the HAPPY SECTOR COPY, all with WARP DRIVE SPEED, including our diagnostic, a \$350.00 value for only \$249.95, for a limited time only! Price includes shipping by air mail to U.S.A. and Canada. Foreign orders add \$10.00 and send an international money order payable through a U.S.A. bank. California orders add \$16.25 state sales tax. Cashiers check or money order for immediate shipment from stock. Personal checks require 2-3 weeks to clear. Cash COD available by phone order and charges will be added. No credit card orders accepted. ENHANCEMENTS for other ATARI compatible drives coming soon, call for information. Specify 1050 or 810 ENHANCEMENT, all 1050s use the same ENHANCEMENT. Please specify -H model for all 810 disk drives purchased new after February 1982, call for help in 810 ENHANCEMENT model selection. Dealers now throughout the world, call for the number of the dealer closest to you.

ATARI is a registered trademark of Atari Computer Inc.

HAPPY COMPUTERS, INC. • P. O. Box 1268 • Morgan Hill, California 95037 • (408) 779-3830

SEE HALLEY'S COMET ON YOUR ATARI

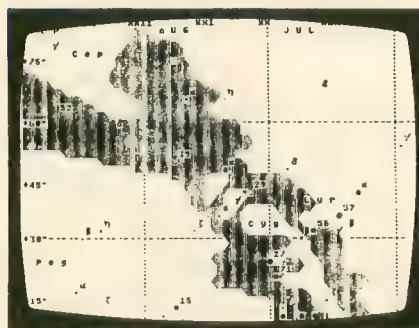
New software super-maps!

by GIGI BISSON, Antic Assistant Editor

Space Base, Halley Patrol, and Earth Views are three new educational programs that bring space vistas into your living room with amazing impact.

This software opens up the map-making potential of 8-bit Atari computers in ways never seen before—rapidly producing sophisticated and scientifically accurate images.

It's doubtful whether these programs could have been written—or run—on any 64K computer but the Atari. Because sales were limited to the Atari market, the authors couldn't find a publisher willing to take a chance on such high-quality scientific material. So the programs are now available only from the Antic Arcade Catalog in this magazine.



HALLEY PATROL

It may be your only chance to see Halley's Comet.

"The comet won't be visible from the Northern Hemisphere unless you really go out of your way," says programmer and amateur astronomer Jeff Mehlman.

But with Mehlman's Halley Patrol, the comet will be visible on your

Atari. It soars across the screen against a changing background of stars, as celestial coordinates flash below to indicate the location.

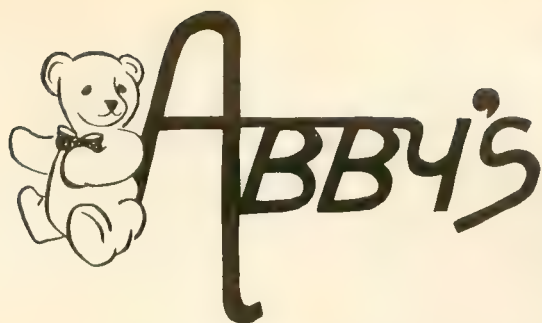
Click. Find out the best month to observe the comet, when the moon and sun aren't at their brightest in your hometown skies.

Click. Pick any day between November, 1985 and May, 1986—and find out where the comet is, how bright it will be, and what it will look like.

"I'd make a lot more money if I could also write this program for the Commodore and the Apple," says Mehlman. "But those other computers are too limited to handle it."

Mehlman is employed as a software systems analyst for the Best retail

continued on page 38



**ABBY'S CARRIES A FULL SELECTION
OF SOFTWARE FOR YOUR ATARI.
CALL FOR CURRENT PRICES.**

ATARI HARDWARE

800 XL	\$ 89
1200 XL	\$ 69
520 ST System (Disk Drive, Mouse, Monochrome Monitor, Software)	\$789
520 ST RGB System (Same as above but with Color RGB Monitor)	\$989
SF 354 3 1/2 Addition Floppy Drive	\$179
SMM801 Dot Matrix	\$199
SDM 121 Daisy Wheel	\$249
1050 Disk Drive	\$149
1020 Color Printer	\$ 29
1027 Daisy Wheel	\$199
1025 Dot Matrix	\$149
1030 Modem	\$ 69

ATARI SOFTWARE

Codewriter (D)	\$39
Filewriter (D)	\$24
Reportwriter (D)	\$24
Menuwriter (D)	\$24
Adventurewriter (D)	\$21
Home Integrator (D)	\$24
Small Business Inventory (D)	\$13
Salesman's Expenses (D)	\$13
ARI/AP (D)	\$13
Retail Invoice (D)	\$13
Final Legacy (R)	\$16
Star Voyager (D)	\$13
Atari Lab Starter Kit (R)	\$45
Atari Lab Light Module (R)	\$34
Millipede (R)	\$16
Moon Patrol (R)	\$16
Track & Field (R)	\$25
Family Finances (D)	\$23
Football (R)	\$13
Home Filing Manager (D)	\$25
Assembler Editor (R)	\$27
Microsoft Basic II (R & D)	\$45

BRODERBUND

Print Shop	\$35
Paper Refill	\$13
Stealth	\$23
Spelunker	\$23
Whistler's Brother	\$23
Bank St. Writer	\$44

BATTERIES INCLUDED

Home Pak	\$39
Paperclip	\$49
B/Graph	\$59

EPYX

Rescue on Fractulus	\$25
Ball Blazer	\$25
Jet Combat Simulator	\$25

DISCOUNT SOFTWARE

SOFTWARE HITS

Ghostbusters	\$24
Spy V Spy	\$26
Bruce Lee	\$26
Dallas Quest	\$24
PQ Party Quiz	\$39
Fancy Fonts	\$25
Flight Simulator II	\$39
Gyruss	\$39
Mind Wheel	\$34
(Needs 2 Drives)	
Trivia Quest	\$34
Bank St. Musicwriter	\$39
Bounty Bob Strikes Back	\$39
Beachhead	\$26
Home Accountant	\$55
Micro League Baseball	\$31
Team Disk (for above)	\$15
Halley Project	\$29
Summer Games II	\$29
Kororis Rift	\$29
Load Runners Rescue	CALL
Temple of Apshai	CALL

Six Gun Shootout	CALL
Field of Fire	\$31
Operation Market Garden	\$39
Kampfgruppe	\$49
Computer Ambush	\$49
Knights of Desert	\$35
Rails West	\$35
War in Russia	\$49
Computer Baseball	\$31
Questron	\$31
Carrier Force	\$49
Broadsides	\$31

SSI

Us Doubler	\$59
(Makes 1050-180K)	
3 Times Faster, True Double Density	

ICD

Us Doubler	\$59
(Makes 1050-180K)	
3 Times Faster, True Double Density	

INNOVATIVE CONCEPTS

Data Case (Holds 50)	\$11
Flip & File II (Lock 25)	\$15

ELECTRONIC ARTS

MULE	\$16
Pinball Construction Set	\$16
One On One	\$23
Seven Cities	\$23
Archon II	\$23

AMERICAN EDUCATIONAL

Phonics	\$29
Learn to Read	\$29
Reading Comprehension I, II, III	\$29
Spelling Grades 2-8	\$29
ALL OTHER TITLES	\$17

INFOCOM

Zork I, II, III	ea. \$29
Hitchhiker's Guide	\$34
Suspect	\$34
Cutthroats	\$34
Deadline	\$34
Witness	\$29
Starcross	\$34
Infidel	\$31
Seastalker	\$29
Wishbringer	\$29
Invisicue Books	\$ 7
Sorcerer	\$31
Conan	\$25
Ultima I	\$24
Ultima II-IV	ea. \$39

MICROPROSE

Decision in the Desert	\$31
F-15 Strike Eagle	\$27
Hell Cat Ace	\$24
Kennedy Approach	\$27
Mig Alley Ace	\$27
Solo Flight	\$27
NATO Commander	\$27
Crusade In Europe	\$31

ABBY'S SPECIAL BUYS

Atariwriter (R)	\$29	Basic Tutor Kit (C)	\$24
Visicalc (D)	\$29	(5 Tapes - 3 Books)	
Synfile (D)	\$35	Bookkeeper Kit (D)	\$79
Synalc (D)	\$35	All Spinnaker Titles (R)	\$16
Syntrend (D)	\$35	Pac-Man (R)	\$ 7
Arcade Champ (R)	\$21	Pac-Man (R)	\$ 7
(Pac-Man, Qix & 2 Joysticks)		Star Raiders (R)	\$ 7
Super Breakout	\$ 7	Caverns of Mars (D)	\$ 7
Timewise	\$ 7	Basketball	\$ 7

HARDWARE & ACCESSORIES

Indus GT	\$239	Ribbons for Okimate 10	\$6
All Epson Printers		Disk Notcher	\$ 5
Starting as low as	\$239	Covers - All Types For Printers	
All Star Micronic Printers		And Computers	from \$7
Starting as low as	\$239	Ape Face	\$69
Bulk Dennison or Nashua Disks,		Koala Pad	\$59
SSDD, 100 or More	each \$1	80 Column Card	CALL
Okimate 10	\$199	(Batteries Included)	
(With Interface Included)			

ALL TITLES ON DISK UNLESS MARKED (R) FOR ROM CARTRIDGE

Order Line

1-800-282-0333

**ORDERS ONLY! Sales Personnel Do
Not Have Information on
Previous Orders or Product Specs.**

M-F 10 a.m.-7 p.m.; Sat. 10-3 ET

37 S. Broad Street, Fairborn, OH 45324

Customer Service

1-513-879-9699

AD #AT-105



Prepaid orders over \$50 receive free shipping, UPS, continental US. No waiting period when paid by credit card, certified check or money order. Add \$2 shipping and handling on orders under \$50. Add \$5 for COD orders. \$15 Minimum for VISA/MC. Hardware requires additional freight charges. Ohio residents add 5.5% sales tax. All items subject to availability and price change.

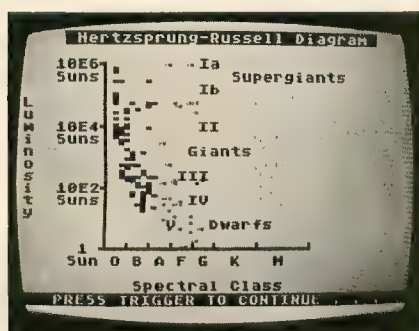
PLEASE CITE AD NUMBER WHEN ORDERING.



chain in Richmond, Virginia. He studied astronomy at Northwestern University.

"I was working on the graphics and trying hard to make the comet as realistic as possible, he recalls. My wife looked over my shoulder and said, 'Why don't you make it red with orange things shooting out of it or something?'"

He resisted the temptation to create a flashy lightshow. "The graphics would have been easy on the Atari," he says, "But I wanted to be astronomically accurate."



SPACE BASE

It's a cloudless, starry night. An extension cord snakes through the kitchen window onto the back patio, where a computer screen glows in the darkness.

"There's Orion," someone cries out. But is it really Orion? How do you know what you're really seeing in the heavens unless you squint at a sky atlas lit by a dim flashlight?

Enter the realm of computer-aided stargazing. Move your joystick to the right and an astronomical map of the 400 brightest stars in a vivid blue Milky Way Galaxy scroll by.

Zero in on Orion, press the joystick button and a stargram pops on the screen, indicating the star's color and temperature, along with its name, spectral type, distance from Earth in light years and other scientific information.

Press the button again, and a multicolored Hertzprung-Russell diagram appears. This is an astronomy classification tool that indicates a star's color, temperature, luminosity and size in comparison to other stars.

These are just a few of the ways you can use Space Base (\$19.95, API42), an astronomical database and sky atlas for the Atari.

Halley Patrol author Mehlman also wrote Space Base. And he is currently finishing an enhanced version of Space Base that works with a **Celestron Sky-Sensor Telescope**. With the new software and an RS-232 interface, the telescope will move to find an actual star in the sky that has been selected from the database stargram by pressing the joystick trigger.

The database for the software that controls the Celestron motor happens to be the same one used in Space Base, the Messier Catalog. It lists the 285 brightest stars among the 3,000 that are visible to the naked eye.

Mehlman also ended up writing nearly a full textbook of documentation for Space Base. "The program teaches the equivalent of about one year of college astronomy," he says. "Even if you just play around with it, sooner or later you're bound to learn something."

He daydreams about seeing Space Base used in a museum or observatory lobby. "This is the only fully labelled star atlas you can get," he says. The Greek letters, special star symbols, fine scrolling and minute detail are only possible with the Atari's redefined character capabilities. "Star programs on other personal computers just show a bunch of dots," he says.



EARTH VIEWS

Control the world with your joystick. Watch the Earth rotate in your Atari computer. Call up 250,000 different maps, each linked to a huge database of cities, states and continents. Get lost in the privacy of your own home.

Richard Wilson's Earth Views (\$19.95, API41) does some of the

amazing things you expected from personal computers when you first bought one—and also some amazing things you weren't expecting.

Earth Views is the first program you can buy for any personal computer that depicts a 3-D image of the earth in rotation on any axis. It's also a geography lesson, trivia quiz, atlas and adventure game.

Wilson's globe display revolves on any axis, or from either pole. A geographic database of some 250,000 different views of Earth can be accessed 29 different ways from the keyboard and joystick. Instantly you can see Japan, Ancient Greece, Stonehenge, Delaware, Timbuktu. Map after map flashes up in high resolution format, so fast that it creates an illusion of "paging" from a huge mainframe computer.

When you put in the disk a flat map of the world appears, overlaid with a view of the earth as seen from space. Press [START] and the earth will begin to rotate. Press [SELECT] and you'll see the question "What place?"

Type in the first four letters of any state, province, river, island, nation, etc. For example; Lima, Peru. Instantly a world map appears, as seen from the viewpoint of a satellite hovering directly above Lima.

Ever wonder where you would end up if you tried to dig a hole to China from your hometown? Press the Inverse Video key and get an immediate display of the exact opposite end of the world.

Use the joystick to move an "airplane" over the world. Press [RETURN] and the name of that place appears. But if you fly over the Bermuda Triangle, watch out... You'll be sent on a geographical adventure/trivia game that fires off names of far flung places. You find one part of the world, only to be sent on another distant quest.

"Don't be embarrassed if you don't have the faintest idea where a place is located," says Earth Views author Wilson. "The world is a big place, and even college-educated Americans are sadly weak in their knowledge of geography." He included a [HELP] key compass for those of us with a lousy sense of direction.





COMPUTER PALACE WE KNOW ATARI!

CALL US AT (503)683-5361 FOR INFORMATION

Help Calc

**SPREADSHEET
TEMPLATES
READY TO LOAD-N-GO
FOR USE WITH SynCalc™**

"Software fit for a King!"
Royal Software

**Let Help Calc Help
You For Only . . .**

\$19.95

Requirements:
SynCalc program.
48K (min) Atari
computer.
At least one disk
drive.
80 column
printer.

DEALER INQUIRIES INVITED

• Templates included:

- Loan Amortization Schedule
- Net Present Value
- Future Value
- Personal Financial Statement
- Alternative Investment Analysis
- Check Register
- Personal Register (Roster)
- Depreciation Schedule

- FEATURES:**
- Eight ready-to-use Templates.
 - Easy to use . . . just load them from SynCalc and enter your data.
 - Save hours of tedious spreadsheet setup.
 - All formats are pre-tested for accuracy.
 - Complete, professionally written instruction manual with spreadsheet examples.

INVENTORY MASTER

"Software fit for a King!"
Royal Software



FEATURES:

- Over 1900 items per Double Density disk.
- Part number with Product Description.
- Quantity in stock/Number of orders outstanding.
- Three vendors with cost from each vendor.
- Last Purchase Order and from which vendor.
- Min/max re-order level.
- Last six months sales history.
- Retrieve any item within 5 seconds.
- Fast edit capability.
- Automatic Record updating from Purchase Orders and Product Invoices.

DEALER INQUIRIES INVITED

Requirements
48K (min) Atari computer
At least one disk drive.
80 column printer.

\$89.95

REPORTS GENERATED:

- Purchase Orders
- Recommended Orders Report
- Inventory Control Report
- Product History Report
- Outstanding Orders by Vendor
- Monthly Sales and Inventory Level Totals
- Product Price List
- Period to Date Sales Report
- Daily Transactions Report

FREE CATALOG

with any order . . . or send \$1 (refundable with first purchase)

**IF YOU DON'T HAVE OUR
CATALOG . . . YOU'RE
MISSING OUT!**

NEW! 64 PAGE SUMMER ISSUE



DELUXE ONLY \$8.95 EACH

**DUST
COVERS**

Additional covers
ordered at same time

ONLY \$7.95 EACH

Custom fitted, attractive leather brown color:

- ATARI 400, 800, 600/800/1200XL, New XE & ST, 410, 810, 1050, 1025, 1027, CX85 • EPSON, GEMINI, PRO-WRITER printers • INDUS, RANA, PERCOM, TRAK disk drives.

Protect Your Equipment

BOOKS

De Re Atari	\$17.90
Technical Users Notes	\$26.90
Kids & the Atari	\$19.95
Best of Antic	\$12.95
Best of Antic w/disk	\$24.95
Machine Lang. I/Beg	\$14.95
2nd Bk. of Machine Lang.	\$14.95
Your Atari Computer	\$17.95
Master Memory Map (350 pg.)	\$15.95
Master Memory Map (30 pg.)	\$4.95
Adventures with the Atari	\$16.95

PRINTERS

Epson LX-80	\$259.95
Epson FX-80	\$395.00
Star SG-10	\$269.00
Axiom SLP	\$199.95
SLP Tracker	\$29.95
Axiom 550	\$279.00
Prowriter 8510SP	\$399.00
Prowriter 1550	\$499.00
Atari 1025	\$239.50
Atari 1027	\$199.00
Atari 850 Interface	\$139.50

— SUPER SPECIALS —

Gorf (C)	\$ 5.95	Tricky Tut, 1-12 (D)	\$ 7.95
Del. Invaders (C)	\$ 5.95	Pharaoh's Curse (D)	\$ 9.95
Wizard of Wor (C)	\$ 5.95	Ballblazer (D)	\$ 25.95
Krazy Shootout (C)	\$ 5.95	Buck Rogers (D)	\$ 25.90
Atari Speed Rd. (T)	\$19.95	Flight Simulator II (D)	\$33.50
Invit. to Prog. #3 (T)	\$19.95	Pool 400 (C)	\$14.95
Touch Typing (T)	\$14.95	Archon (D)	\$19.90
Baseball A.H. (T)	\$15.50	Bk. of Atari SW '84	\$ 9.95
Crossfire (T)	\$ 9.95	Compuserve	\$29.95
Match Racer (D)	\$ 9.95	Percom S1 Drive	\$159.95
Pathfinder (D)	\$ 9.95	130XE	\$159.95
Miner 2049er (D)	\$17.95	520 ST PACKAGE	Call

TRIVIA QUEST



- Outsmart Your Friends
- Outwit The Dragon
- Join The Quest

48K Disk

\$39.95

• Program Covers
4 Disk Sides

A new concept in computer gaming. Intellectual challenge, strategy and arcade action. Each player assumes the role of a lord with a questing party of three characters. Complete the quest, earn the most gold by answering questions and battling the dragon. Win the favor of the king and thus, the game.

TRIVIA QUEST \$24.95
UTILITY EDITOR 48K, Disk

The Trivia Quest Utility Editor is designed for convenient creation and editing of questions for Trivia Quest. Create new music and text questions, or change the questions that are already available. This program also includes another 1000 questions for use with the Trivia Quest program.

Super Mailer PLUS

**One of the
most versatile
data-base
programs available.**

- Maintain your book library
- Organize your record collection
- Index your recipes
- Categorize your stamp collection
- Unlimited applications!

**48K Disk
\$49.95**

Features:

- LIGHTNING FAST RETRIEVAL
- FAST SORTS ON ANY FIELD
- SUPPORTS UP TO 4 DRIVES
- SINGLE OR DOUBLE DENSITY
- STORE ABOUT 1100 RECORDS PER DISK SIDE IN DOUBLE DENSITY
- MUCH MORE!

Includes:

- ON-SCREEN PROMPTS
- HELP SCREENS
- STATE ABBREVIATION TABLE
- PRINT LABELS 1, 2, or 3-UP
- REDEFINABLE FIELDS
- MERGE-CREATE COMBINATION FILES
- DELETE DUPLICATE-AUTO or MANUAL

Super Merger

\$19.95
48K, Disk

SuperMerger makes files from SuperMailer Plus compatible with any word processor (e.g., AtariWriter, Letter Wizard) that uses standard Atari DOS, and has a mail-merge function. This means you can design a form letter and send it to all the names on your SuperMailer Plus mailing list. SuperMerger also allows you to arrange the data from SuperMailer Plus in any sequence that is desired.

**USE YOUR CREDIT CARD & CALL
Toll Free 1-800-452-8013
★ ORDERS ONLY, PLEASE ★**

There's never a penalty for using your credit card!
For Information, Call (503) 683-5361



**COMPUTER
PALACE**

OPEN M-F, 9-6 Sat. 10-4 (Pacific Time)

2160 W 11th Avenue Eugene, Oregon 97402



SHIPPING INFO: Minimum \$2.90 Ground. \$4.75 Air. Actual Cost depends on weight. Call (503) 683-5361 for information.
WARRANTY INFO: Everything that we sell is warranted by the manufacturer. If any item purchased from us fails to perform properly when you receive it, call us at (503) 683-5361 so that we can assist you. No returned merchandise accepted without authorization. Defective software will be replaced with another copy of the same program, otherwise, no software is returnable.

A

STUDENT TESTS S.A.T. SOFTWARE

Grades for Krell and HBJ

by DIANNA HARMS

My dad, Ken Harms, is an **Antic** contributing editor. He reads a lot of computer magazines and sees reviews of programs that are supposed to improve your SAT scores. But those reviews are written by computer buffs. Why not a review by a high school student who's actually going to *use* these programs to prepare for the college placement tests?

I'm about to start my high school senior year in Danville, California. I have taken the SAT and ACT tests about four times during the past six years—twice as part of a research project. I have a 3.75+ GPA and I score very well on verbal and TSWE. But don't ask me about math! And I'm certainly no computer whiz kid.

For this article, **Antic** sent me copies of **Computer Preparation for the SAT** (\$79.95) by Harcourt Brace Jovanovich (HBJ) and the much more expensive **Krell's College Board SAT Exam Preparation Series** (\$229.95) from Krell Software

Corp.

HBJ's nice plastic package contains three double-sided disks, a 50-page User's Manual and a 469-page workbook, **How to Prepare for the SAT**, that's also sold separately for \$7.95. Quite intimidating, do I really have to read all this?

Krell's package is a smaller, bookshelf-sized cardboard box. Open it and out fall eight single-sided disks, a 47-page booklet and all sorts of contest posters, catalogs, guarantees, etc.

Krell costs more, but the company offers to refund the purchase price if you fail to increase your score by 50 points after using the program for at least 6 hours. However, normal classroom learning over the months between SAT tests would probably get you most or all of those 50 points.

HBJ HASSLES

HBJ's disks are divided into three major sections: math and vocabulary drills, vocabulary flashcards, and four full-length tests. The User's Manual stated: "To run the software, simply

insert the disk and turn on the power." I did. Nothing happened . . . several times.

Dad had to rescue me by suggesting that I try putting the BASIC cartridge into our 800 model. Thanks a lot, HBJ.

I followed HBJ's suggestion and tried the tests first. After several centuries of load time, I was rewarded with a simple screen giving several columns of numbers and blanks.

It seems you're supposed to read the question from the workbook, type the question number and then the answer, followed by [RETURN]. The program is so slow that I had to pause after each key.

For instance, the answer "23A" was [2], pause, [3], pause, [A], pause, [RETURN]. After all this, the program doesn't tell you if the answer is correct until the whole section is finished.

The section is automatically scored, wrong answers are highlighted and the correct answer is given so you can look in the workbook again. User friendly, it wasn't.

The drills are well organized by learning category (analogies/sentences, analogies/categories, etc.). For each question, you get two chances to answer correctly and you know immediately if you are right or wrong.

After answering, you can request an explanation. In general, I found the explanations helpful. They showed why the answer is correct and gave suggestions for solving similar problems. Although the math explanations were sometimes too simple, at least they made sense to me!

But after answering each question, the program infuriatingly asks, "Do you want an explanation? (Y/N)." A [Y] response tells you to "Press [E] for explanation". And if you press [N] the program says "Press [C] to continue." Even to me, it was obvious that these extra steps could be eliminated by intelligent programming.

On the plus side, HBJ'S workbook is a strong feature. It offers good old-fashioned study guidance, all the answers to test questions, and a good review of each subject area. Although it takes a lot of work, I think it'd be helpful for a brush-up. And it's only \$7.95 without the software.

KRELL'S CASE

Krell's booklet gave simple and accurate loading instructions—a quick plus! The eight disks are divided into verbal and math, four apiece. Krell provides an "Automatic Learning Feature" (ALF) which is supposed to look at your performance and "alter the way in which problems are selected for presentation."

But I didn't see any change when I answered some questions with ALF turned on and some without. Vocabulary words were repeated anyway, even when I got them right the first time.

When the first analogy appeared on the screen, I was relieved that there wasn't a timer. That's because I spent most of the time thumbing through my trusty pocket dictionary. The words are ridiculous—much harder than I ever found on the actual SAT.

Example: The antonym of "RECALCITRANT" is "EMBLAZON, COM-

PLIANT, PROBITY, INCUBUS or SATURNINE." Yep, it sure is!

The drill gives no help or explanation, just the right answers. Questions appear quickly. Responses are accepted rapidly.

After each question, the program stops to show your cumulative score and waits for you to press a key to continue. I didn't like this. It broke my concentration and I wanted the score only after the end of a session.

THAT'S NO EXPLANATION, IT'S A DEATH SENTENCE!

Krell uses a scoring system of 4 for right, 0 for skip, and -1 for wrong. I have no idea if that approximates the SAT, especially for the small sets of questions Krell lets you choose.

Krell's math is terrifying. The questions seem to be from medium to hard, mostly hard (at least to me).

Example: WHAT IS THE LENGTH OF A LINE BETWEEN POINT A (5,-2) AND B (2,-4)?

Now look at Krell's explanation:

THE DISTANCE BETWEEN ANY TWO POINTS IS EQUAL TO THE SQUAREROOT (sic) OF THE SUM OF THE SQUARES OF THE DIFFERENCES OF THEIR X AND Y COORDINATES. (THE PYTHAGOREAN THEOREM)

IN THIS CASE: THE SQUAREROOT OF 13

That's no explanation, it's a death sentence! If you can understand their explanation, you obviously don't need one. The explanation ends with a question: "Do you want another question of this type?" Not a chance! And once again, you must look at your score.

Krell's little booklet contains reading selections and a few math-related diagrams. Neither program in-

cludes diagrams for the geometry questions on the disk.

WOULD THEY HELP?

These programs have two purposes: 1) get the student familiar with the SAT testing style. 2) increase the student's knowledge.

The HBJ package certainly familiarizes the student with the test, but at the cost of a huge time investment. And if these programs also intend to make the student feel more comfortable with the exam, I think Krell fails. It made me feel most uncomfortable, even ignorant.

HBJ's explanations in the verbal sections seemed to help increase knowledge. Their flashcard set did just that. But Krell's entire verbal sections were simple flashcards. With both, however, you won't get much help unless the word you studied appeared on the SAT—only *one* did on my last test.

HBJ's math sections could provide learning increases, especially if you studied the workbook. But Krell's math instruction was way beyond me.

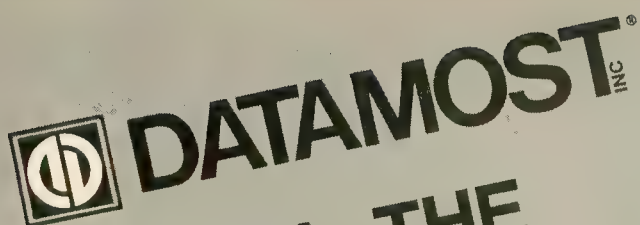
You have to be really motivated to put up with either of these programs. The hours and hours of real work required to study are even more difficult to endure with both HBJ and Krell's built-in frustrations.

These are *serious* programs—no sound, no color, no special effects—just dry, unremitting drills. Be sure you're ready for this type of experience before you lay out any money.

COMPUTER PREPARATION FOR THE SAT

Harcourt Brace Jovanovich
757 Third Avenue
New York, NY 10017
(800) 543-1918
\$79.95, 48K disk

KRELL'S COLLEGE BOARD SAT
Krell Software Corp.
1320 Stony Brook Road
Stony Brook, New York 11790
(516) 751-5139
\$229.95, 48K disk



DATAMOST^{INC.}
HAS ALL THE
RIGHT STUFF^{FOR} YOUR

ATARI!

**We did something about
high-priced software!**

**WE CALL
IT...**

Kwik-Ware!TM
PRODUCTIVITY SOFTWARE

Why
pay \$100,
\$75 or even \$50
for productivity pro-
ducts for your Atari! Try our
KWIK-WARE! line at just \$19.95
each. All KWIK-WARE! products deliver
the highest quality at an amazingly low price.



\$19⁹⁵
Each

COMPUTER BOOKS

You've heard about our award winning computer books. Our books have been on top of the charts for years and have received rave reviews in the process. . . But, did you know that we have books for your Atari Home Computer?

ABCs of Atari Computers

"The most useful book on the Atari since Your Atari Computer." — *BARON'S MICROCOMPUTING REPORTS*

"This one's a gold mine for the new and experienced Atari owner." — *COMPUSERVE*

Atari Roots

"It has been a long wait for an accurate comprehensive beginner's text for the Atari assembly language programmer. If you have the commitment, do yourself a favor and buy *Atari Roots* first." — *CURRENT NOTES*

Books for your Atari by Datamost

ABCs of Atari — \$14.95
Atari Roots — \$14.95
Computer Playground — Atari — \$9.95
Elementary Atari — \$14.95
Games Ataris Play — \$14.95

General Interest Books

A Shortcut through Adventureland Vol. I — \$9.95
A Shortcut through Adventureland Vol. II Infocom — \$9.95
Computers and Young Minds — \$9.95
Getting into Computers — \$12.95
Programming for Profit — \$14.95
101 Uses for your Home Computer — \$4.95

Call or write to us for more information or a
catalog of our products for your Atari.

KWIK-WRITE!™ — a full-featured word processor for your Atari that offers the power of dedicated systems at an affordable price! KWIK-WRITE! allows you to set tabs; merge files; cut and paste; restore deleted text; justify, center and indent text and more! KWIK-WRITE! supports the most popular printers and offers a printer driver menu for ease of use! \$19.95

KWIK-SPELL!™ — a spelling checking program for your Atari that features a 30,000+ word dictionary with the ability to add your own commonly used words. KWIK-SPELL! is compatible with KWIK-WRITE! and other popular word processors. \$19.95

KWIK-FILE!™ — a menu driven, full-featured database for your Atari. KWIK-FILE! offers the ability to specify up to 50 fields, sort records, cross reference data, print mailing labels, add a security password and much more! \$19.95

KWIK-PHONE!™ — a telecommunications package featuring simple command menus, automatic answer, built in phone book, selectable baud rate and more! \$19.95

KWIK-PAD!™ — a desk secretary for your Atari. This handy utility features a calculator mode, memo pad, appointment book, calendar, address book and more! \$19.95

KWIK-CHECK!™ — a checking account reconciliation and maintenance program that will maintain an unlimited amount of checking accounts. With KWIK-CHECK! you can itemize expenses, flag tax-deductible items, print your check register in different formats, post and void checks and more! \$19.95

KWIK-MAIL!™ — a complete mailing list program with label generating capabilities. With KWIK-MAIL! you can specify your own fields, design your own label formats, merge files and integrate KWIK-WRITE! documents for customized form letters. KWIK-MAIL! also has complete sorting capabilities for specialized mail list handling. \$19.95

KWIK-PRINT!™ — a graphic print designer package that turns your computer and printer into a print shop! KWIK-PRINT! features multiple fonts and design editor. With KWIK-PRINT! you can create letterheads, banners, stationary and cards! \$19.95

KWIK-FORM!™ — a customized form and report generator that allows you to create, utilize and print out forms and reports for home or business. With KWIK-FORM! you can create and utilize invoices, recipe cards, home or business inventory and more! The usefulness of KWIK-FORM! is limited only by your imagination! \$19.95

Coming soon!

KWIK-TYPE!™ — a typing tutor for your home computer.

KWIK-MERGE!™ — a handy utility that allows you to easily manipulate data from one KWIK-program to another.

and more . . .

KWIK-PAD!, KWIK-WRITE!, KWIK-SPELL!, KWIK-CHECK!, KWIK-FILE!, KWIK-PHONE!, KWIK-FORM!, KWIK-MAIL!, KWIK-PRINT!, KWIK-MERGE!, KWIK-TYPE! and KWIK-WARE! are all trademarks of DATAMOST, Inc.
Atari is a registered trademark of Atari, Inc.

ENTERTAINMENT SOFTWARE

Over the years Datamost has established a solid reputation for publishing "hit" entertainment software. We carefully design each game to fully utilize the powers of your Atari. Whether it's challenging play, animated color graphics or symphonic sound, all Datamost games have that extra "something special." Balanced by thoughtful quality control and concise documentation, our games continue to lead the way into the future of entertainment software for your Atari.

Mr. Robot and his Robot Factory

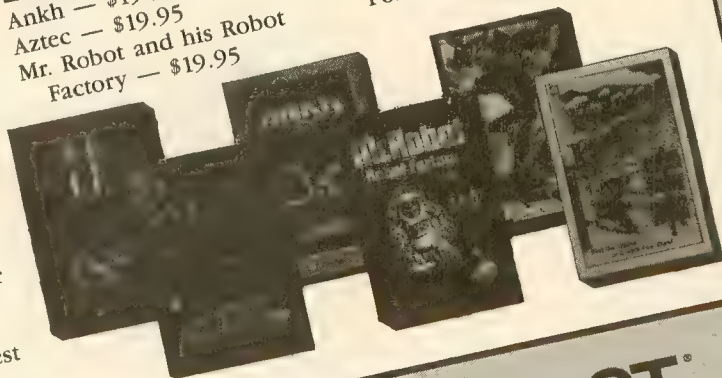
"An exceptional blend of time-tested elements forms a truly challenging and exciting game. I highly recommend Mr. Robot and his Robot Factory." — A+ MAGAZINE

Aztec

"Aztec is one of those rare games that demands — and usually gets — your undivided attention . . . the game never gets stale." — ELECTRONIC FUN

"Playsters ages 10 and up found Aztec one of the best games of the year. . . ." — FAMILY COMPUTING

Entertainment Software for your Atari
 Jet Boot Jack — \$19.95
 Mychess II — \$29.95
 Polar Pierre — \$19.95
 Ankh — \$19.95
 Aztec — \$19.95
 Mr. Robot and his Robot Factory — \$19.95



DATAMOST™

Distributor and Dealer Inquiries Invited

19821 Nordhoff Street, Northridge, CA 91324
 (818) 709-1202



Y

OGA BREATHING

Your guru, the Atari

by LEN DORFMAN and JERRY WHITE

Your Atari can be used as a meditation tool for helping you learn to relax and fight stress. This BASIC program runs on all 8-bit Atari computers of any memory size, with disk or cassette.

Atari enthusiasts tend to believe that using their favorite computer makes them feel better. Now you can put this to the test! Use your trusty machine to help you learn the breathing techniques of pranayama yoga which—if done right—let you relax and fight the stress of the workaday world.

Before you RUN the Yoga Breathing program, (Listing 1, BREATHE.BAS, which needs to be typed in, checked with TYPO II and SAVED), read this article to learn the basic yoga approach to breathing for relaxation.

HOW TO BREATHE

Within your chest are a heart and two lungs. Below that is the abdomen, separated by a flexible muscle called the diaphragm.

Breathing expands the lungs and draws air into your body. Oxygen is then extracted from the air and passed into your blood. Without sufficient oxygen you'll be sluggish, drowsy and lethargic. Thus, correct breathing requires drawing air into the lungs so that the greatest amount of blood receives oxygen.

Pushing your abdomen outward pulls the diaphragm down, expanding the lower lungs and creating a vacuum to draw air in. If you sit in an upright position, gravity will force more blood into the bottom of your lungs than into the middle or top.

With this type of breathing, called diaphragmatic, you get more air into your lower lungs—where there is more blood to carry oxygen through the body. This is the most efficient method of breathing.

Unfortunately, most people usually do chest breathing, which is not nearly as effective. In chest breathing you expand the ribs to aerate the central lungs. This is relatively inefficient because most of the air does not end up in the lower lungs where there is

more blood to carry oxygen through the body.

FINE CONTROL

When you've learned to breathe diaphragmatically, this computer program will help you master the fine control of your breathing process. People with respiratory diseases should consult their doctor before using this program.

With this fine control, a person who practices structured diaphragmatic breathing daily will gradually be able to produce the respiratory patterns associated with relaxed states of mind.

A good way to get started breathing diaphragmatically is to try this exercise: Lie flat on your back. Put one hand on your abdomen and the other on your chest. Keep your mouth closed for all breathing exercises and breathe exclusively through your nose. When you inhale, push your abdomen out and try to keep your chest from moving. When you exhale relax the muscles you used to push your abdomen out.

If you are breathing diaphragmatically, the hand on your abdomen will rise and fall as you breathe, while the hand on your chest remains steady.

Now would be a good time to try a simple relaxation procedure. Find a quiet dimly-lit space in your abode. Lie flat on your back, close your eyes and begin breathing in a gentle, relaxed, diaphragmatic fashion. When you inhale, imagine clean, fresh, vitalizing air entering your body. When you exhale, imagine that all your muscular tensions are leaving with your breath. Try it!

The next step is to try that same two-handed breathing exercise in a straight-back chair. You may discover that your exhalation in this position might not seem as complete as when you were lying flat. The reason is that when you are flat on your back, gravity will aid your exhaling. But when you're sitting upright, the motion of your abdomen is horizontal.

USING THE PROGRAM

RUNning the Yoga Breathing program, you'll see the word

PRANAYAMA at the top of the screen. This is the Sanskrit word denoting certain yoga breathing practices. Below this, you'll see the following parameters: SOUND, COUNT, INHALE, RETAIN, and EXHALE. As you are modifying any of the parameters, they will appear in double height letters.

Place a joystick in port 1. Stick up or down moves between parameters. Stick left and right will change the value of the parameter.

The sound feature gives you audible cues to time your breathing cycle. But at first, you'll want to use both the screen and sound prompts to cue your breathing. So leave the SOUND on. Next highlight COUNT and set the value to 10. Change INHALE to 4, RETAIN to 0, and EXHALE to 4. When these values are set, press the joystick trigger.

The program will display the word INHALE for approximately 4 seconds, RETAIN will be bypassed, and EXHALE will be displayed for 4 seconds.

MASTER THE FINE CONTROL OF YOUR BREATHING PROCESS

The cycle will repeat ten times. While the program is running you can sit with a relaxed straight back and begin timing your diaphragmatic breathing to the program. This current set-up will allow for approximately 80 seconds of practice ($10 * [4 + 4] = 80$).

Once you've gotten the hang of using the program, set COUNT to 40. Again begin diaphragmatic breathing and press the trigger. Follow the cues of the program, remembering to breathe through your nose in an even fashion. There should be no pauses or jerkiness in the breathing.

Yogis place great value on the relation between inhalation, retention and exhalation cycles. Try starting at 4 seconds for the inhale, 0 seconds for the retain, and 4 seconds for the exhalation. Notice that the relationship of the inhale, retain, and exhale is 1,0,1. That is a traditional beginning formula.

As you begin to become comfortable with the breathing practice you might want to gradually slow your inhale and exhale to 10 seconds for each. A summary of some breathing patterns is listed in the table below.

INHALE	RETAIN	EXHALE
1	0	1
1	0	2
1	1	1
1	1	2
1	2	2
1	4	2

The bottom four relationships are for advanced yoga students and should not be attempted without instruction from a competent Yoga instructor.

In a world filled with pressure it is useful to develop skills that help shield ourselves from the potential ravages of stress. If your breathing session goes well you will most likely feel more relaxed afterward.

For further reading, I warmly recommend *The Science of Breath* by Swami Rama, R. Ballentine, M.D. and A. Hymes, M.D., published by the Himalayan Institute of Yoga Science and Philosophy.

High school teacher Len Dorfman is a rarity—a professional, speedy machine language programmer who never really learned BASIC. He originally submitted this program to Antic as a lengthy, hard-to-type assembler listing. So for a smooth BASIC conversion, we suggested that Len get together with his fellow Long Islander, Antic Contributing Editor Jerry White.

Listing on Page 56



Explore the world of visual calculus and create three-dimensional graphs from mathematical functions. This BASIC program will run on all Atari computers with 48K memory and a disk drive.

If you've seen the fantastic, computer-generated landscapes in movies such as "The Last Starfighter," you know what a three-dimensional graph looks like. Graph 3D creates three-dimensional objects in Graphics Mode 8, based upon functions of the form: $Z=f(X,Y)$. Your landscapes, or objects will not be solid, but you can alter the density of the graph lines.

The second part of this article will cover technical details, but you don't need a degree in calculus to create shapes with Graph 3D. Here's how to get it up and running.

GETTING STARTED

Type in Listings 1 and 2 and check them with TYPO II. There's some machine language in these programs, so make sure that your TYPO II codes are correct and that

you haven't left out any lines. SAVE Listing 1 as GR3DLOAD.BAS. Since Listing 1 automatically runs Listing 2, be sure and SAVE Listing 2 as GRAPH3D.BAS and don't try to run GRAPH3D.BAS by itself. Those using Antic's DISKIO (January, 1985) should boot these programs without it.

Run the program GR3DLOAD.BAS. First a title and then a menu will appear. After a brief pause, a black graphics screen will take its place and begin drawing a sample graph. When the graph is completed, the menu will return. You can switch between the menu and the graphics screen by pressing [SPACE]. The commands on the menu are single letter options which can be used from either the screen or the menu. Choose a command option by pressing the letter with no [RETURN].

For example, let's SAVE the picture that's currently on the screen. Be sure there's a disk with 62 free sectors in Drive 1. Type [S] and, at the prompt, type in the filename and then press [RETURN] and answer [Y]. You don't need the D: device prefix and Graph 3D will automatically add an extender of .G3D. For the technically oriented, Graph 3D files are straight Graphics 8 + 16 picture files consisting

GRAPH 3D

Spectacular three-dimensional visuals!

by PAUL CHABOT



of 7680 bytes of screen data followed by 13 records containing parameter information. (See lines 910-918.)

ENTERING A FUNCTION

Let's type in a function without worrying about why it works. (We'll save that for later.) Get to the menu by pressing [SPACE], if you're not already there. Type [F] for function. You should see the current function and under it, $Z=$. Now type $1-2*Y*Y$ and press [RETURN]. Next, type [E] for eye placement, then type $10,10,5$ [RETURN]. Set the magnification to 120 by typing [M] [120] [RETURN]. Center the graph by typing [C] [160] [RETURN] [30] [RETURN]. Finally, type [I] and enter $-2,2,-1,1$ [RETURN].

Now, to graph the object to the screen, press [G]. Parts of the menu will flash and you'll see the message "Computing Points." The graphics screen will then appear and begin drawing an object that should end up looking like a trellis tunnel.

ALTERED STATES

Many of the menu choices in GRAPH 3D alter the view

of the displayed object. In most cases, you must press [G] to redraw the object using the new values. The best way to understand any of the commands is to try different values, press [G], then examine the results.

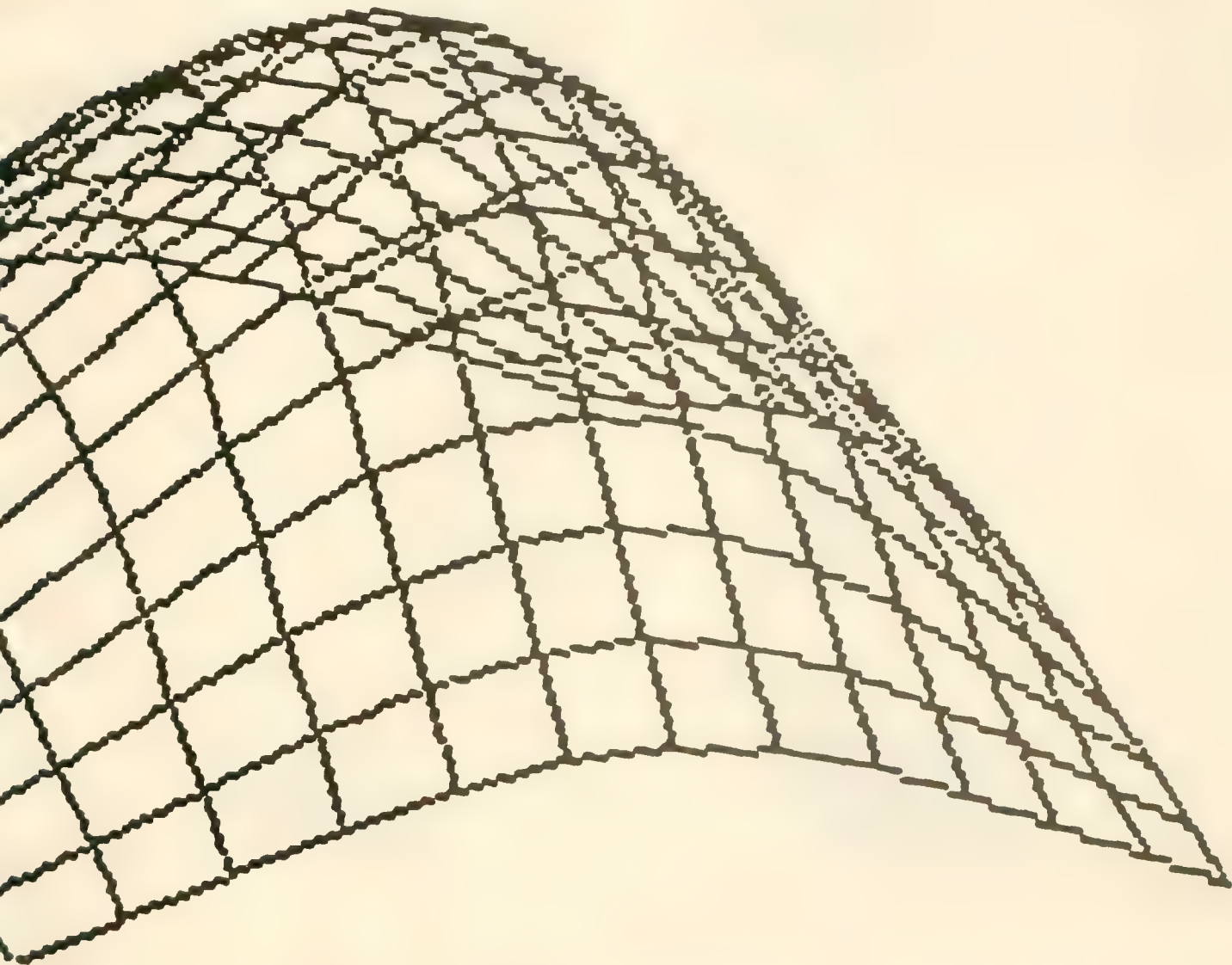
Our example shows [M] will change the magnification of the graph and [C] will shift it on screen by entering new X and Y coordinates based upon the usual screen grid where 0,0 is the upper left corner.

[E] is the eye location in three-dimensional space. Place a square grid on the floor and the two directions of the grid are X and Y. A pole running perpendicular from the floor is the Z axis, and the three values entered are in order: X,Y,Z.

You can change the number of X and Y cross-grid lines with [N]. High values give more detail to the surface but require more computing time. The maximum value allowed is 24.

[O] when pressed, increments the graphing option. Various features of the surface can be accentuated by showing some cross-sections and not others. The options are:

continued on next page



- 0—all available cross-sections graphed.
- 1—all X sections, only first and last Y section.
- 2—all Y sections, only first and last X section.
- 3—all X sections, every third Y section.
- 4—all Y sections, every third X section.
- 5—every third cross-section.

If you wish to alter these options, see lines 306–318 and 522.

The two intervals defining the rectangular region under the graph can be altered with [I]. These will show up in square brackets on the screen, but should be entered in order AX,BX,AY,BY.

[F] permits you to enter a new function. If your object ends up a complete mess, have no fear! Press [R] and you may restore your previous graph which has been saved in memory.

[R] will also work after a graph file has been loaded with the [L] command. The [L] command, which loads a previously saved picture file, is similar to the [S] save command in that you only need to enter the name and the computer will provide the device and .G3D extender.

[D] will search the disk for any files with .G3D extenders and display them in the menu directory.

[P] is a screen dump designed to print the graphics screen to your printer. It is designed for a Gemini 10X but the routine, which begins at line 960, could be altered

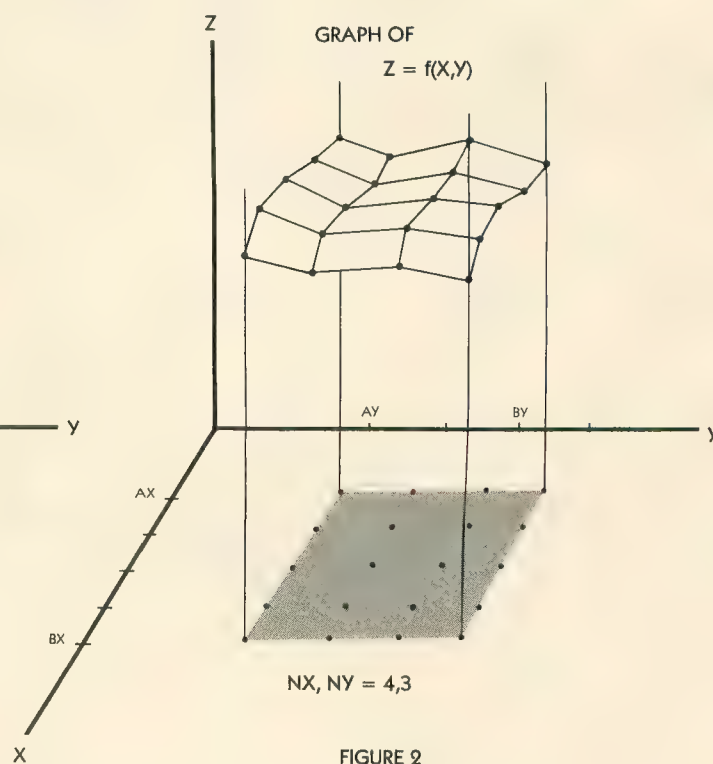
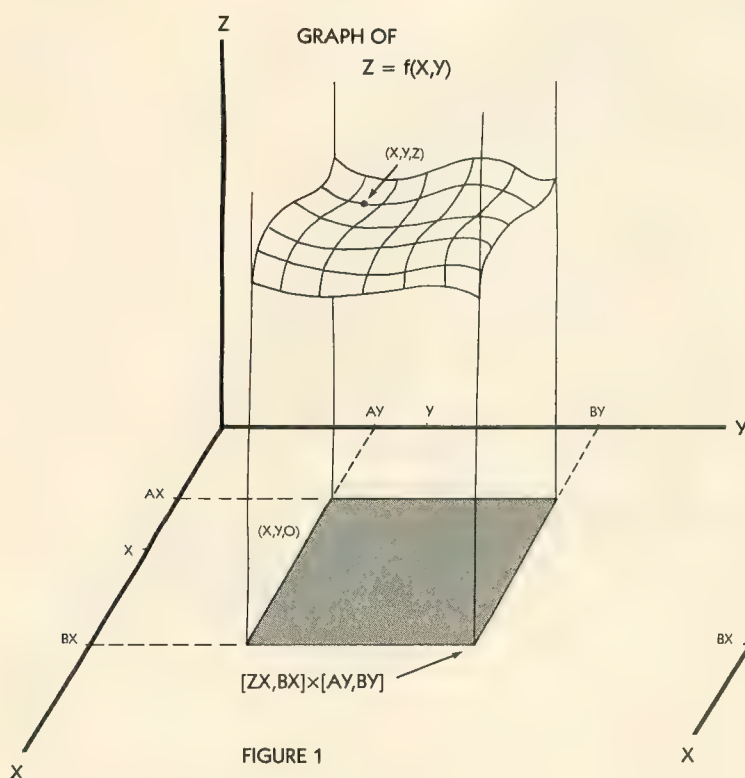
for your own printer. (For a much faster screen dump that will work on various printers and can be used with Graph 3D files, see "Kwik Dump" by Jerry Allen, *Antic*, March, 1985 —ANTIC ED.)

TECHNICAL INFO

Each point (P) in three-dimensional space is determined by a "triple" (X,Y, and Z coordinates). The first two coordinates specify a spot in the usual X,Y plane, which is visualized as lying on the floor. The third coordinate gives the distance of P above or below this spot. *Figure 1* shows the usual orientation of the three axes.

The graph of a function $Z=f(X,Y)$ is the collection of all triples, where the third coordinate, Z, is computed from the first two using the function f. For example, the graph of $Z=X*X+Y*Y$ contains points like (1,1,2), (2,3,13), (-1,2,5) since each of these satisfy the equation. Specifically, the third coordinates are all obtained from the first two by using the rule $Z=X*X+Y*Y$. Such graphs are visualized as surfaces in three-dimensional space.

Obviously we cannot draw the entire graph of a function. Graph 3D sketches only portions of graphs. *Figure 1* depicts a typical situation. Along the X-axis we have the interval [AX,BX]. Along the Y-axis you'll see the interval [AY,BY]. Together these describe the rectangular region $[AX,BX] \times [AY,BY]$. This consists of all pairs X,Y with $AX \leq X \leq BX$ and $AY \leq Y \leq BY$. Above each spot in this region there is a point on the graph. The third coordinate



Z is found by evaluating $f(X,Y)$. It is also clear that we can't do this for every possible X,Y in the region.

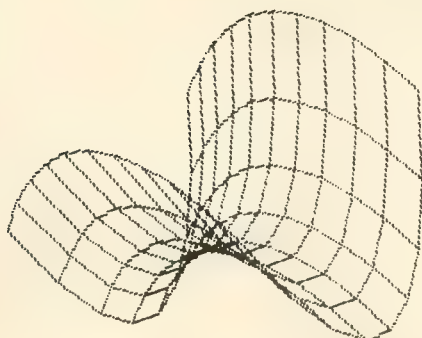
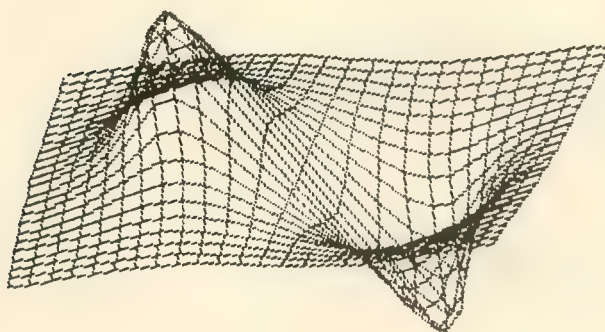
This is where the partition sizes NX,NY come into play. Figure 2 shows a 4,3 partitioning. With NX=4 the interval [AX,BX] along the X-axis is broken into 4 equal pieces (subintervals). Whereas the Y-axis interval [AY,BY] is split into 3 subintervals. This leads to 20 spots of interest in the rectangular region. The function $f(X,Y)$ is then computed at each of these, resulting in 20 data points actually on the graph. We now connect these with line segments to get a rough idea of the shape of the graph.

Larger values of NX,NY will give you a better looking picture but will take more time. Also, if you plot too many data points and joining line segments, your picture can quickly become cluttered. This is solved with the graphing options [O].

FUNCTIONS TO TRY

To get you started here's a list of functions with suggested rectangular domain and eye location. When you build up the courage to try your own just be careful to avoid the "value error" trap. Be sure that the function you use is defined on the entire rectangular region. Graph 3D will accept each of the following examples. Use the menu selections [F], [I], and [E] to input the data.

1. $Z=1-2*X*X$
[-2,2]x[-1,1] eye:10,10,5



2. $Z=X*X+2*Y*Y$
[-1,1]x[-1,1] eye:10,14,4
3. $Z=\sin(3*X)$
[-1,1]x[-1,1] eye:10,15,12
4. $Z=\sqrt{X*X+3*Y*Y}$
[-3,3]x[-1,1] eye:10,2,3
5. $Z=\exp(-X*X-Y*Y)$
[-2,2]x[-1,1] eye:4,10,3
6. $Z=4*X*X*X*X-4*X*X+Y*Y$
[-1,1]x[-1,1] eye:10,17,4
7. $Z=1/(0.5+X*X+Y*Y)-1/(0.5+X*X+(Y-2)*(Y-2))$
[-2,2]x[-2,4] eye:20,10,10
8. $Z=\cos(3*X*Y)$
[-1,1]x[-2,2] eye:20,10,40
9. $\exp(\sin(X*Y))$
[-3,3]x[-3,3] eye:10,20,30
10. $Z=X*X*X+2*Y*Y*Y$
[-1,1]x[-1,1] eye:10,10,5

You'll find the 3D graphs of some of these functions illustrating the article. If you create an impressive new function, be sure to send it to **Antic** as an I/O Board letter.

Paul Chabot, professor of mathematics and computer science at California State University, Los Angeles, returns to BASIC here after publishing ACTION! graphics programs in the April and June, 1985 issues of Antic.

Listing on page 57

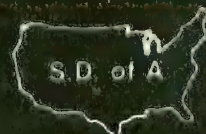


Software Discounters of America

For Orders Only—1-800-225-7638

PA Orders—1-800-223-7784

Customer Service 412-361-5291



Open Saturday

- Free shipping on orders over \$100 in continental USA
- No surcharge for VISA/MasterCard
- Your card is not charged until we ship

ACCESS	CONTINENTAL	Summer Games II (D) .. Call	LEARNING COMPANY	DOS XL (D)	\$21	Breakthrough in the
Beach Head (D)	Book of Adv. Games	\$14	Bumble Games (D)	MAC 65 (R)	\$49	Ardennes (D)
ACTIVISION	Home Accountant(D)	\$44	Colorasaurus (D)	MAC 65 Tool Kit (D)	\$21	Broadsides (D)
Decathlon (R)	DATAMOST		Magic Spells (D)	Writer's Tool w/		Carrier Force (D)
Gary Kitchen's	Aztec Challenge (D)	\$16	Reader Rabbit (D)	Spell Checker (R)	\$44	Colonial Conquest(D)
Gamemaker (D)	My Chess II (D)	\$19	Word Spinner (D)	ORIGIN		Combat Leader (D)
Ghostbusters (D)	DATASOFT		MISC.	Ultima III (D)	\$39	Computer Ambush (D)
Great American Cross	Alternate Reality (D)	\$26	Fancy Writer (D)	PROFESSIONAL		Computer Baseball(D)
Country Road Race (D)	Bruce Lee (D)	\$19	Microleague Baseball (D)	SOFTWARE		Computer QB (D)
Hacker (D)	Conan Barbarian (D)	\$19	Omnitrend Universe	Fleet System 2 (D)	\$49	Cosmic Balance (D)
Master of the Lamps(D)	Dallas Quest (D)	\$19	Personal Accountant (D)	Trivia Fever (D)	\$21	Cosmic Balance II (D)
Music Studio (D)	Elevator Action (D)	\$19	MICROPROSE	SCARBOROUGH		Eagles (D)
Mindshadow	Letter Wizard w/Spell		Acro Jet: Advanced	MasterType (D)	\$21	Epidemic (D)
Pitfall II (R)	Checker (D)	Call	Flight Simulator(D)	Net Worth (D)	\$44	50 Mission Crush (D)
ARTWORX	Mr. Do (D)	\$19	Air Rescue 1 (D)	SIERRA ON LINE		Field of Fire (D)
Bridge 4.0 (D)	Pac Man (D)	\$16	Crusade in Europe(D)	Dark Crystal (D)	\$25	Fortress (D)
Compubridge (D)	Pole Position 2 (D)	Call	Decision in Desert(D)	Frogger (D)	\$12	Galactic Adventures (D)
French (D)	The Goonies	\$19	F-15 Strike Eagle (D)	Homeword (D)	\$33	Gemstone Warrior (D)
German (D)	Zorro (D)	\$19	Gun Ship: The Helicopter	Oil's Well (D)	\$12	Imperium Galactum (D)
Ghostchaser (D)	ELECTRONIC ARTS		Simulation (D)	Ultima I (D)	\$23	Kampfgruppe (D)
Monkeymath (D)	Archon (D)	\$17	Kennedy Approach (D)	Ultima II (D)	\$39	Knights of Desert(D)
Spanish (D)	Archon II (D)	\$23	Mig Alley Ace (D)	Wizard & Princess(D)	\$19	Objective Kursk (D)
Strip Poker (D)						Operation Market
Female Data Disk						Garden (D)
Male Data Disk						Questron (D)
AVALON HILL						Rails West (D)
B-1 Nuclear Bomber (D)						Reforger '88 (D)
Combat Chess (D)						Six-Gun Shootout (D)
Computer Stocks						Tigers in Snow (D)
& Bonds (D)						War In Russia (D)
Jupiter Mission 1999 (D)						SUBLOGIC
Legionnaire (D)						Flight Simulator II(D)
Maxwell Manor (D)						Night Mission Pinball (D)
Panzer Jagd (D)						SYNAPSE
Quest of the						Alley Cat (D)
Space Beagle (D)						Blue Max 2001 (D)
T.A.C. (D)						Essex (D)
Telengard (D)						Lode Runner's
BATTERIES INCLUDED						Rescue (D)
B-Graph (D)						Quasimodo (D)
Home Pak (D)						Syn-Calc (D)
Paperclip (D)						Syn-Calc Templates (D)
BIG FIVE						Syn-Chron (D)
Bounty Bob (R)						Syn-Comm (D)
Miner 2049'er (R)						Syn-File (D)
BRODERBUND						Syn-Stock (D)
Arcade Machine (D)						TIMWORKS
Bank St. Writer (D)						Data Manager (D)
Championship						Electronic Checkbook (D)
Loderunner (D)						Money Manager (D)
Karateka (D)						TRONIX
Loderunner (D)						S.A.M. (D)
Mask of the Sun (D)						ACCESSORIES
Operation Whirlwind(D)						Ape Face Printer
Print Shop (D)						Interface
Print Shop Graphics						Astra Disk Drive
Library #1 (D)						BASF SS, DD
Print Shop Graphics						Bonus Disks
Library #2 (D)						Compuserve Starter
PS Paper Refill						Kit (5 hrs.)
Serpent's Star (D)						Digital Devices
Stealth (D)						U-Print A
Whistler's Brother (D)						Digital Devices A16
CBS						Printer Interface
Addition/Subt. (D)						w/16K Buffer
Astro Grover (R)						Disk Case (Holds 50)
Big Bird's Funhouse (R)						Disk Drive Cleaner
Big Bird's Spc						Dows Jones News
Delivery (R)						Retrieval Membership
Decimals: Add/Subt.(D)						Kit (5 hrs.)
Decimals: Mult./Div.(D)						Dust Covers
Dr. Seuss Puzzler (D)						Full Stroke Replacement
Ernie's Magic Shapes (R)						Keyboard for AT400
Fractions: Add/Subt.(D)						Indus GT Disk Drive
Fractions: Mult./Div.(D)						MPP1000E Microbits
Linear Equations (D)						Modem
Match Wits (D)						Rana 1000 Disk Drive
Mult./Division (D)						Sakata 13" Color
Quadratic Equations (D)						Monitor
Sesame St. Letter						Wico Bat Handle
Go Round (R)						Wico Boss
Timebound (R)						Wico Three Way
Webster Word Game (D)						Wico Trackball

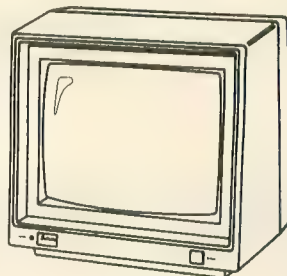
MONTHLY MADNESS SALE!

Sakata

...we promise performance

The SC-100 is designed to work with Apple, Atari, Commodore, IBM-PCjr, and other personal computers. Includes audio speaker and standard earphone jack; provides the most vibrant brilliant colors; tested, proven, and rated as the best color monitor available.

SC-100



* monitor cables available for \$7.

List \$299⁹⁵ Madness Price \$159⁰⁰

Sold to the first 85 customers

PS Paper Refill	\$14	Cut & Paste (D)	\$19	Enchanter (D)	\$23	Nato Commander(D)	\$23	SPINNAKER	
Serpent's Star (D)	\$25	Financial Cookbook (D)	\$29	Infidel (D)	\$26	Silent Service: The Submarine		Adventure Creator(R)	\$17
Stealth (D)	\$19	Hard Hat Mack (D)	\$17	Hitchhiker's Guide		Simulation (D)	Call	Aerobics (D)	\$23
Whistler's Brother (D)	\$19	Murder on the		to the Galaxy (D)	\$23	Solo Flight (D)	\$21	Alphabet Zoo (R)	\$17
CBS		Zinderneuf (D)	\$19	Planetfall (D)	\$23	MINDSCAPE		Delta Drawing (R)	\$17
Addition/Subt. (D)	\$16	Music Construction		Seastalker (D)	\$23	Bank St. Music Writer (D)	\$26	Facemaker (R)	\$17
Astro Grover (R)	\$19	Set (D)	\$17	Sorcerer (D)	\$26	Crossword Magic(D)	\$33	Fraction Fever (R)	\$17
Big Bird's Funhouse (R)	\$19	One-on-One (D)	\$25	Starcross (D)	\$29	Halley Project—		Kids on Keys (R)	\$17
Big Bird's Spc		Pinball Construction		Suspect (D)	\$29	A Mission in Our		Kindercomp (R)	\$17
Delivery (R)	\$17	Set (D)	\$17	Suspended (D)	\$29	Solar System (D)	\$26	Math Busters (D)	\$19
Decimals: Add/Subt.(D)	\$16	Realm of		Wishbringer (D)	\$23	Tink's Adventure (D)	\$19	Rock 'N Rhythm (D)	\$19
Decimals: Mult./Div.(D)	\$16	Impossibility (D)	\$17	Witness (D)	\$23	Tink's Subt. Fair (D)	\$19	Snooper Troops	
Dr. Seuss Puzzler (D)	\$19	Seven Cities of Gold (D)	\$25	Zork I (D)	\$23	Tonk in the Land of		1 or 2 (D)	\$19
Ernie's Magic Shapes (R)	\$17	EPYX		Zork II or III (D)	\$26	Buddy-Bots (D)	\$19	Story Machine (R)	\$17
Fractions: Add/Subt.(D)	\$16	Balblazer (D)	\$25	KOALA		Tuk Goes to Town (D)	\$19	Trains (D)	\$19
Fractions: Mult./Div.(D)	\$16	Dragonriders Pern (D)	\$19	Light Pen (D)	\$59	MUSE		Beyond Wolfenstein (D)	\$23
Linear Equations (D)	\$16	Gateway Apschai (R)	\$19	Spider Eater (D)	\$9	Castle Wolfenstein (D)	\$19	SPRINGBOARD	
Match Wits (D)	\$19	Jumpman (D)	\$16	Touch Tablet		OSS		Early Games (D)	\$23
Mult./Division (D)	\$16	Jumpman Jr. (R)	\$16	w/Painter(D)	\$29.95	Action (R)	\$49	Fraction Factory (D)	\$19
Quadratic Equations (D)	\$16	Koronis Rift (D)	\$26	Coloring Series (D)	\$9	Action Tool Kit (D)	\$21	Make A Match (D)	\$19
Sesame St. Letter		Pitstop (R)	\$19	LJK		Basic XE (R)	\$49	Music Maestro (D)	\$23
Go Round (R)	\$19	Puzzle Panic (D)	\$19	Data Perfect (D)	\$39	Basic XL (R)	\$39	Piece of Cake Math (D)	\$23
Timebound (R)	\$16	Rescue on Fractalus (D)	\$25	Spell Perfect (D)	\$39	Basic XL Tool Kit (D)	\$21	SSI	
Webster Word Game (D)	\$19	Summer Games (D)	\$25	Spell Perfect (D)	\$29	Battle Normandy (D)	\$26		

P.O. BOX 278—DEPT. AT—WILDWOOD, PA 15091

*Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping:** Continental U.S.A.—Orders under \$100 add \$3; **free shipping on orders over \$100.** PA residents add 6% sales tax. AK, HI, FPO-APO—add \$5 on all orders. Sorry—no international orders. Defective merchandise will be replaced with same merchandise. Other returns subject to a 15% restocking charge—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.

SOFTWARE LIBRARY

Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

► **PLAY BLUEGRASS MUSIC LIKE A BIONIC EARL SCRUGGS!**

BANJO PICKER 55

► **YOUR GURU, THE ATARI...**

YOGA BREATHING 56

► **SPECTACULAR THREE-DIMENSIONAL VISUALS!**

GRAPH 3D 57

► **TYPO II UPDATE**

MATH WIZARD 60

► **GAME OF THE MONTH**

ALIEN ASYLUM 62

► **BONUS GAME**

LEMONADE 63

► **ASSEMBLY LANGUAGE**

FINE SCROLLING WORLD: PART II 64

► **CONVERT AN 8-BIT ATARI PROGRAM FOR THE ST**

GEM COLOR CASCADE 66

TYPING SPECIAL ATARI CHARACTERS 52

HOW TO USE TYPO II 53 ERROR FILE 53

DISK SUBSCRIBERS: You can use all these programs immediately.
Just follow the instructions in the accompanying magazine articles.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publisher.

Antic program listings are typeset on the Star's SG-10 printer—from Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

```

ABCDEFGHIJKLMN OPQRSTUVWXYZ
ABCDEFGHIJKLMN OPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789          0123456789
  
```

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below. (Squares are drawn around the normal video characters so you can see their positions more accurately, these squares will not appear in listings.)

NORMAL VIDEO			
FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H		ESC CTRL -
	CTRL I		ESC CTRL =
	CTRL J		ESC CTRL +
	CTRL K		ESC CTRL *
	CTRL L		CTRL .
	CTRL M		CTRL ;
	CTRL N		SHIFT =
	CTRL O		ESC
	CTRL P		SHIFT
	CTRL Q		CLEAR
	CTRL R		ESC DELETE
	CTRL S		ESC TAB

INVERSE VIDEO			
FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL Y
	CTRL A		CTRL Z
	CTRL B		ESC
	CTRL C		SHIFT
	CTRL D		DELETE
	CTRL E		ESC
	CTRL F		SHIFT
	CTRL G		INSERT
	CTRL H		ESC
	CTRL I		CTRL
	CTRL J		TAB
	CTRL K		ESC
	CTRL L		SHIFT
	CTRL M		TAB
	CTRL N		CTRL .
	CTRL O		CTRL ;
	CTRL P		SHIFT =
	CTRL Q		ESC CTRL 2
	CTRL R		ESC
	CTRL S		CTRL
	CTRL T		DELETE
	CTRL U		ESC
	CTRL V		CTRL
	CTRL W		INSERT
	CTRL X		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.) Note: In the printed listings, inverse characters will be slightly smaller than the normal ones.

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be *thicker* than the alpha-nums. Compare the two sets of characters below:

SPECIAL	STANDARD
CTRL F	/
CTRL G	SHIFT +
CTRL N	SHIFT -
CTRL R	-
CTRL S	+

HOW TO USE TYPO II

TYPO II is the improved automatic proofreading program for Antic's type-in BASIC listings. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at left of the line number. Press [RETURN].

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:"). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:"). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.

Don't type the
TYPO II Codes! 

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINES(120):CLOSE #2:CLO
SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2:LINE
$:IF LINES="" THEN POSITION 2,4:LIST B
:GOTO 32060
XH 32070 IF LINES(1,1)="*" THEN B=VAL(LIN
ES(2,LEN(LINES))):POSITION 2,4:LIST B:
GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINES):POSITION 1,3:? " ":
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
```

Don't type the
TYPO II Codes! 

```
ET 32120 ? "K":POSITION 11,1:? "TYPO II"
":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3:LINE$:IF
LINE$="" THEN ? "LINE ";B:" DELETED":G
OTO 32050
VV 32150 FOR D=1 TO LEN(LINES):C=C+1:ANS=
ANS+(C*ASC(LINES(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE):CHR$
(LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
t match press [RETURN] and edit line a
bove.":GOTO 32050
```

ERROR FILE

GUESS THAT SONG

July 1985

The September, 1985 HELP! section contains an easier-reading listing of some of the tougher data lines in Guess That Song.

MUSICIAN

June 1985

Change line 790 to:

```
790 IF A=54 THEN
POSITION 4,22:? *
6;"song cleared":
GOTO 810
```

MANEUVER

April 1985

If you get hearts on the title screen, LIST the program to disk or cassette, type NEW, then ENTER and SAVE it.

FONT MAKER FOR SG-10

March 1985

The July 1985 issue of ANTIC contains a listing which, when merged with FONT MAKER, makes that program work on the Star SG-10. See the HELP section of that issue for instructions.

KWIK DUMP

March 1985

The last number in line 1070 should be 27 instead of zero.

KOOKY'S QUEST

February 1985

The following line is missing:

```
2100 FOR S=32 TO 16 STEP
-4: SOUND 0,8,14,10: EA=EA
*EA*EA: SOUND 0,0,0,0: EA=1
^0:NEXT S
```

WIDE TEXT

January 1985

Substitute the following

lines to print wide Z's.

In assembly:

```
0600 COPY #27*
8 ;8 BYTES TO A
LETTER
```

In BASIC:

```
CT 20130 DATA 216
,208,213,185,0,22
4
```

ADVENT X-5

November 1984

Missing line: 8020 RUN. Also, cassette owners should change the 138 in line 4005 to 130. The TYPO II code for line 1005 is EJ.

COMPUTER MAIL ORDER

THE CMO ADVANTAGE

- ✓ THE BEST PRICES!
- ✓ Next day shipping on all in stock items.
- ✓ Free easy access order inquiry.
- ✓ Orders from outside Pennsylvania and Nevada save state sales tax.
- ✓ Free technical support with our factory trained technical staff.
- ✓ There is no limit and no deposit on C.O.D. orders.
- ✓ There's no extra charge for using your credit card. Your card is not charged until we ship.
- ✓ No waiting period for cashiers checks.
- ✓ We accept purchase orders from qualified corporations. Subject to approval.
- ✓ Educational discounts available to qualified institutions.
- ✓ FREE CATALOG MEMBERSHIP.

ORDER LINE

1-800-233-8950

In PA 1-800-242-4215
CUSTOMER SERVICE AND TECH SUPPORT
1-717-327-1450

Dept. B609

MAILING ADDRESS

COMPUTER MAIL ORDER

Department B609,
477 E. Third Street
Williamsport, PA 17701



MEMBER DIRECT MARKETING ASSOCIATION

CREDIT CARDS



SHIPPING

Add 3%, minimum \$5.00 shipping and handling on all orders. Larger shipments may require additional charges.

All items subject to availability and price change.

Returned shipments may be subject to a restocking fee.

CANADIAN ORDERS

1-800-268-3974
Ontario/Quebec

1-800-268-4559
Other Provinces

1-416-828-0866
In Toronto

TELEX: 06-218960
2505 Dunwin Drive,
Mississauga, Ontario
Canada L5L1T1

All prices shown are for U.S.A. orders. Call The Canadian Office for Canadian prices.

SPECIAL PACKAGES



Package #AAB400P Includes:
Atari 400 16K color computer,
410 program recorder, Basic cartridge,
and dust cover.

\$59.99



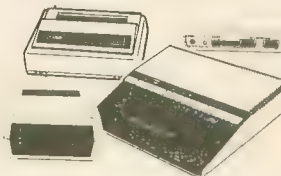
Package #AAB400G Includes:
Atari 400 16K color computer,
822 thermal printer, 20 assorted
game cartridges, 482 The
Educator (410 program recorder,
Atari Basic cart., States &
Capitals program cassette).

\$119.99



Package #AAB800P Includes:
Atari 800 48K color computer,
810 disk drive, 410 program
recorder, Basic cartridge, box of
10 disks, and dust cover.

\$239.00



Package #AAB1200P Includes:
Atari 1200XL 64K color computer,
810 disk drive, 825 printer,
850 interface.

\$379.00

WARRANTIES

AAB1200W 1-yr. warranty for
AAB1200P pkg.

\$99.99

AAB800W 1-yr. warranty for
AAB800P pkg.

\$69.00

AAB400W 1-yr. warranty for
AAB400P pkg.

\$39.00

AAB1200W 1-yr. warranty for
AAB400G pkg.

\$69.00

NOTE

All items sold "as is" with a 15 day exchange policy. Units available for sale for the most part do not have instruction manuals and/or original packaging. Some units may have minor cosmetic damage. All units are in new working condition.

All items are in Limited Quantities.

CARTS

\$2.99 EACH
(Minimum of 3)

AAB4013 ASTEROIDS
AAB8130 CAVERNS OF MARS
AAB4020 CENTIPEDE
AAB4025 DEFENDER
AAB8026 DIG DUG
AAB8031 DONKEY KONG
AAB8039 EASTERN FRONT
AAB8030 E.T.
AAB4024 GALAXIAN
AAB4012 MISSILE COMMAND
AAB4022 PAC MAN
AAB4027 QIX
AAB4008 SPACE INVADERS
AAB4011 STAR RAIDERS
AAB4006 SUPER BREAKOUT
AAB4010 3-D TIC-TAC-TOE
AAB8045 MUSIC COMPOSER
AAB8045 PENGU
AAB8029 FOOTBALL
AAB8057 TYPO ATTACK
AAB8033 ROBOTRON
AAB8034 POLE POSITION
AAB8042 TENNIS
AAB8043 MS PACMAN
AAB8044 JOUST
AAB8049 JUNGLE HUNT
AAB4009 CHESS
(Repackaged without instructions)

SPECIALS

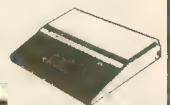
ATARI 400
Computers **\$39.90**



ATARI 800
48K Color Computers
\$69.95



ATARI 1200XL
64K Computers **\$69.95**



ACCESSORIES

ATARI 822
Thermal Printer
\$19.99

ATARI 410
Program Recorder **\$14.99**



INTERFACES
Digital Devices
DDA01.....**\$49.99**
DDA02.....**\$59.99**
DDA02.....**\$69.99**

Curtis
Safety Strip.....**\$19.95**
Bit 3
Full View 80
(80 col. card)....**\$179.00**

RAM BOARDS
Axlon 32K.....**\$39.99**
Axlon 48K*.....**\$74.99**
Axlon 128K.....**\$249.00**
*Expand your Atari 400 to a full 48K
AtariAABCX853 16K.....**\$9.99**

PROGRAMMER KIT
Includes Basic, Self-teaching
Book, and Reference Manual.
\$19.99

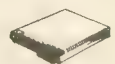
EDUCATOR KIT
Includes 410 Program Recorder,
Atari Basic and the Educational
cassette States and Capitals.
\$24.99

JOYSTICK SPECIALS
Wico Boss.....**\$14.99**
Wico Original Red Ball**\$34.99**
Quickshoot Controller..**\$4.99**
ATARI CX30 Paddles ...**\$9.99**

SOFTWARE SPECIALS
Atari Basic.....**\$14.99**
Atari Writer**\$14.99**
Atari Pilot.....**\$9.99**
Atari Logo.....**\$9.99**
Atari Assembler Editor..**\$9.99**

ATARI 850
Interface **\$99.99**

ATARI 1030
MODEM **\$59.99**



ATARI 835
Direct Modem **\$39.99**

AXIOM

Printers

Model	Model
550	100
\$259.00	\$139.00
Model 846	
Interface	\$59.99

AMDEK
Color 300
\$199.00

NEC
Color 1215
\$239.00



INDUS
ATARI GT
Disk Drive **\$239.00**



SS/SD DISKETTES
Maxell**\$14.99**
Nashua**\$11.99**
(Pack of 10)

TOLL-FREE 1-800-233-8950

BANJO PICKER

Article on page 28

Don't type the
TYPO II Codes!

```

MP 480 REM READ PICK PATTERNS
ZV 490 READ PP:FOR I=1 TO PP:READ X:KB(X)
=-I:FOR J=1 TO 8:READ X:PK(I,J)=X:NEXT
J:NEXT I
MW 500 REM DISPLAY CHORD NAMES
LP 510 POKE 82,2:?:? " CHORDS
PICK PATTERNS"
WR 520 POKE 710,14:POKE 712,14
AQ 530 ? :? "1 2 3 4 5 6 7 8 9
0"
ZL 540 ? CNS(1,12):? "
1 2 3 4 5 6 7 8 9 10 11 12
MW 550 ? "
" ";CNS(13,15);CNS(22,30)
ZQ 560 ? :? " ";CNS(22,24);CNS(31,39):;
REM DON'T FORGET THIS SEMI-COLON
LY 570 C1=167:C2=164:C3=162:C4=161
BC 580 P=5:PP=1:W=100
WW 590 P2=P*3:P1=P2-2:PN=8
EB 600 U=ADR(SIMUL5):F1=0:F2=0:F3=0:F4=0:
LST=255:SKEY=53279
MX 610 POSITION 7,0:?"CHORD " ;CNS(P1,P2
):" PATTERN " ;PP
CL 620 ST=PEEK(560)+256*PEEK(561)+356
LG 630 REM WAIT FOR START KEY OFF THEN ON

VY 640 IF PEEK(SKEY)<>7 THEN 640
WI 650 IF PEEK(SKEY)<>6 THEN 650
MC 660 FOR X=1 TO 25:NEXT X
MX 670 POKE SKEY,8
ZU 680 I=1:J=1:GOTO 70
QW 690 DATA "
EG 700 DATA "-----
TE 710 DATA "+++++
SE 720 DATA "+++++Banjo I
FP 730 DATA "+++++Picker I
ZQ 740 DATA "-----
XZ 750 DATA "
YU 760 REM SOUND POKE ROUTINE
HH 770 DATA 104,133,203,162,0,104,104,157
,0,210,232,228,203,208,246,96
VG 780 REM SOUND FREQ. VALUES
LD 790 DATA 243,230,217,204,193,182,173
EM 800 DATA 162,153,144,136,128,121,114,1
08,102,96,91,85,81,76,72
PF 810 REM CHORD DATA
IR 820 DATA 13
GW 830 DATA 31,18,13,10,6,20,F
IT 840 DATA 30,17,13,8,5,20,C
SJ 850 DATA 26,18,12,8,3,20,G
OU 860 DATA 24,17,13,10,5,20,Am
MO 870 DATA 46,15,12,8,3,20,G
JB 880 DATA 42,15,13,10,3,20,D7
UB 890 DATA 40,17,12,8,5,20,Em
IN 900 DATA 62,19,15,10,7,20,D
LU 910 DATA 58,17,14,10,5,20,A7
ZC 920 DATA 56,19,15,12,7,22,Bm
CY 930 DATA 22,17,14,10,5,22,A
ST 940 DATA 18,17,15,12,5,22,E7
PQ 950 DATA 16,19,14,10,7,22,F#m
LT 960 REM PICK PATTERNS
IG 970 DATA 11
HZ 980 DATA 51,3,2,5,1,4,2,5,1
EW 990 DATA 53,3,2,1,5,1,2,3,1
JZ 1000 DATA 48,3,1,5,3,1,3,4,1
HB 1010 DATA 50,3,2,1,5,3,1,5,1
GO 1020 DATA 11,3,1,5,3,1,5,3,1

```

ANTIC SOFTWARE LIBRARY ★ 55

GJ 1030 DATA 13,2,1,2,1,5,2,1,5
 JP 1040 DATA 8,1,2,3,1,5,2,1,5
 EH 1050 DATA 10,1,2,5,1,2,5,2,1

FG 1060 DATA 1,1,2,1,5,1,2,1,5
 MH 1070 DATA 5,3,5,3,1,5,3,1,5
 CJ 1080 DATA 0,2,3,2,1,2,3,2,1

your guru, the Atari

YOGA BREATHING

Article on page 44

LISTING 1

Don't type the
 TYPO II Codes! 

```

HU 1 REM BREATHE
WT 2 REM BY LEN DORFMAN AND JERRY WHITE
FD 3 REM (C) 1985, ANTIC PUBLISHING
VI 10 GOSUB 7000:GOTO 100
KG 30 REM ONE SECOND SUBROUTINE
YN 40 IF SFLG THEN SOUND 0,PITCH,2,8
ZS 50 POKE 709,15:POSITION 6,21:? #6;PHAS
ES:REM WHITE COMMAND DISPLAY
LR 60 SOUND 0,0,0,0:FOR TICK=1 TO SECS:PO
KE 540,59:REM APPROX 1 SEC COUNTDOWN
FR 62 IF TICK<>SECS THEN 70:REM NOT LAST
SEC
YE 64 WAIT=PEEK(540):IF WAIT>15 THEN 64
HB 66 POKE 709,WAIT:IF WAIT THEN 64:REM F
ADE COMMAND COLOR
HG 68 NEXT TICK:RETURN
QZ 70 IF PEEK(540) THEN 70:REM COUNTDOWN
INCOMPLETE SO LOOP HERE
KR 80 GOTO 68:REM DO IT AGAIN
FY 95 REM RESET DISPLAY
QX 100 OFS=10:OLD=10:POKE DL+10,7
IC 102 REM RESET COLORS AND TURN ON SCREE
M
QX 105 POKE 712,160:POKE 710,156:POKE 709
,160:POKE 708,28:POKE 711,188:POKE 559
,34
YM 108 REM JOYSTICK UPDATE
TC 110 JS=STICK(0):IF NOT STRIG(0) THEN
800:REM TRIGGER PRESSED
RK 115 IF JS=15 THEN 110:REM NOTHING TO D
O
BG 120 IF JS=13 THEN OLD=OFS:OFS=OFS+3:IF
OFS=25 THEN OFS=10:REM STICK DOWN
EG 140 IF JS=14 THEN OLD=OFS:OFS=OFS-3:IF
OFS=7 THEN OFS=22:REM STICK UP
FM 160 IF JS<>7 AND JS<>11 THEN 300:REM S
TICK NOT LEFT OR RIGHT
TG 170 BS=" ":REM CLEAR WORK STRING
LJ 180 IF JS=7 THEN GOTO 500+OFS:REM STIC
K RIGHT
XL 200 GOTO 600+OFS:REM JS=11 STICK LEFT
TU 250 REM SCREEN UPDATE AND NOISE
SK 300 POKE DL+OLD,6:POKE DL+OFS,7:REM OL
D LINE SMALL, NEW LINE BIG
QW 350 REM AUDIO FEEDBACK & DELAY
LZ 400 SOUND 0,OFS*2,10,8:JIF=20
ZM 405 POKE 540,JIF:SOUND 1,0,0,0:SOUND 0
,0,0,0
XY 410 IF PEEK(540) THEN 410
ML 415 GOTO 110
SQ 420 REM ERROR NOISE
EZ 430 FOR VOL=15 TO 0 STEP -0.5:SOUND 0,
102,12,VOL:SOUND 1,51,12,VOL:NEXT VOL
SO 440 JIF=30:GOTO 405
FJ 500 REM VALIDITY CHECK & UPDATE
OQ 510 IF S$(12,14)=" ON" THEN 430
NZ 511 S$(12,14)=" ON":GOTO 700
UC 513 IF COUNT=99 THEN 430
KG 514 COUNT=COUNT+1:GOTO 713
JQ 516 IF INHALE=60 THEN 430
WL 517 INHALE=INHALE+1:GOTO 716
RJ 519 IF RETAIN=60 THEN 430
OK 520 RETAIN=RETAIN+1:GOTO 719
LM 522 IF EXHALE=60 THEN 430
XM 523 EXHALE=EXHALE+1:GOTO 722
JW 610 IF S$(12,14)="OFF" THEN 430
FN 611 S$(12,14)="OFF":GOTO 700
PA 613 IF COUNT=1 THEN 430
LM 614 COUNT=COUNT-1:GOTO 713
RU 616 IF NOT INHALE THEN 430
XW 617 INHALE=INHALE-1:GOTO 716
LZ 619 IF NOT RETAIN THEN 430
PV 620 RETAIN=RETAIN-1:GOTO 719
DU 622 IF NOT EXHALE THEN 430
YX 623 EXHALE=EXHALE-1:GOTO 722
CT 700 GOSUB 9000:GOTO 405
BC 710 REM UPDATE SCREEN STRING S$
FQ 713 S$(73,74)=BS:BS=STR$(COUNT):LB=LEN
(BS):S$(75-LB,74)=BS:GOTO 700
CX 716 S$(133,134)=BS:BS=STR$(INHALE):LB=
LEN(BS):S$(135-LB,134)=BS:GOTO 700
CS 719 S$(193,194)=BS:BS=STR$(RETAIN):LB=
LEN(BS):S$(195-LB,194)=BS:GOTO 700
YI 722 S$(253,254)=BS:BS=STR$(EXHALE):LB=
LEN(BS):S$(255-LB,254)=BS:GOTO 700
YV 790 REM SETUP FOR BREATH CYCLE
YU 800 POKE DL+OFS,6:REM MAKE LARGE LINE
SMALL
XZ 801 SFLG=0:IF S$(13,14)="ON" THEN SFLG
=1:REM SET SOUND FLAG
NT 802 POKE 711,164:POKE 710,164:POKE 708
,164:POKE 712,0:REM RESET COLORS
YB 803 REM BREATH CYCLE LOOP
XJ 804 FOR TIME=1 TO COUNT:BS=STR$(COUNT-
TIME+1):LB=LEN(BS)
RY 805 REM UPDATE COUNT DISPLAY
AK 806 POSITION 11,8:? #6;" "":POSITION
14-LB,8:? #6;BS;
MX 809 REM PHASES=COMMAND
CP 810 IF INHALE THEN PHASES="inhale":SEC
S=INHALE:PITCH=0:GOSUB 40
LP 820 IF RETAIN THEN PHASES="retain":SEC
S=RETAIN:PITCH=1:GOSUB 40
ZV 830 IF EXHALE THEN PHASES="exhale":SEC
S=EXHALE:PITCH=2:GOSUB 40
KH 890 NEXT TIME:OFS=10
ZT 900 GOSUB 9000:GOTO 100:REM RESET SCRE
EN & START OVER
UG 1000 REM INITIALIZATION
TS 7000 GRAPHICS 17:POKE 559,0:? #6:? #6;
" PRANAYAMA"
KE 7100 DL=PEEK(560)+PEEK(561)*256:REM DL
=ADR OF DISPLAY LIST
PE 7200 OFS=10:REM OFFSET TO DL LINE
TO 7300 POKE DL+6,7:POKE DL+26,7:REM LARG
E TEXT LINES
NK 8000 DIM S$(254):S$=" ":S$(254)=" ":S$
(2)=S$:REM SCREEN OPTION DISPLAY
OK 8010 DIM PHASE$(6):PHASES=" ":REM
CURRENT PHASE OR COMMAND
YZ 8020 DIM BS(2):BS=" ":REM BLANK WORK
STRING

```

continued on next page

PARTS/SERVICE FOR ATARI COMPUTERS

FLAT SERVICE RATES BELOW INCLUDE PARTS AND LABOR
60 DAY WARRANTY

800 Computer Repair	\$65.00	800XL Computer Repair	\$67.50
400 Computer Repair	\$47.50	810 Disk Drive Repair	\$79.50
600XL Computer Repair	\$65.00	850 Interface Repair	\$60.00
1200XL Computer Repair	\$65.00	1050 Disk Drive Repair	\$85.00

Above units repaired or exchanged with rebutable exchange
Include \$7.00 return shipping and insurance.

INTEGRATED CIRCUITS

GTIA Chip ... C014805	
upgrade with instructions ...	\$11.50
10K rev. "B" O.S. Upgrade ...	
3 chip rom set with instructions ...	\$12.50
Pokey Chip ... C012294 ...	\$8.50
Antic Chip ... C012296 ...	\$10.00
PIA Chip ... C014795 ...	\$11.00
CPU Chip ... C014806 ...	\$12.50
Basic ROM set ...	\$15.00

MODULES/CIRCUIT BOARDS...complete with IC's

16K Ram Memory Module ...	
CX853 ...	\$18.50
800 10K Rev. "B" O.S. Module ...	\$18.50
800/400 CPU Board with GTIA ...	\$22.50
800 Main Board ...	\$28.50
400 Main Board ...	\$26.50
400 Main Board W/O IC'S ...	\$8.50
800 Power Supply Board ...	\$10.50
810 Data Separator Board ...	
upgrade with instructions ...	\$25.00
810 Side Board W/O Sep. & 1771 ...	\$43.50
810 Rear Power Board ...	\$25.00
810 Analog Board ...	\$16.00

AMERICAN TV

Mail Order & Repair Address ... 15338 Inverness St., San Leandro, CA 94579.
Retail Store ... 1988 Washington Ave., San Leandro, CA 94577.

Terms: We accept money orders, personal checks or COD. VISA Mastercard OK on orders over \$25.00. No personal checks on COD.

Shipping: \$4.00 Shipping and handling on orders under \$150.00. Add \$2.00 for COD orders. CA res. include 6-1/2% sales tax. Overseas shipping extra.

Prices subject to change without notice. We reserve the right to limit quantities. Sales limited to stock on hand. Much More! Send SASE for free price list.
Repair and upgrade services available. Call *Atari is a registered trademark of Atari, Inc.

Custom 810 Disk Drive ...	\$149.50
400 Computer-Complete ...	\$39.50
410 Data Recorder ...	\$28.50
800XL/600XL Power Supply ...	\$35.00
16K EPROM Board ...	\$8.50
8K EPROM Board ...	\$7.50
4K EPROM Board ...	\$5.50
Cartridge Case ...	\$2.50

MISC.

810 Rear Board/Analog Board Upgrade ...	
with 10 pin jumper and instructions ...	\$39.50
Editor Assembler ...	\$25.00
Basic Cartridge W/O Case, Manual ...	\$23.50
810 Board Set ...	\$99.50
810 Mech ...	\$75.00
Replacement power transformer ...	\$16.50
Sams Repair Manual	
for 800 or 400 ...	\$19.95 EA.
800 Keyboard Repair ...	\$35.00
De Re Atari ...	\$12.50

PHONE 415-352-3787

SOUTHERN SOFTWARE DIVISION OF SOUTHERN SUPPLY CO.

1879 Ruffner Rd. Birmingham, AL 35210
PHONE 205-956-0986

SEND SELF ADDRESSED STAMPED ENVELOPE FOR
OUR TOP 50 SPECIAL SHEET UPDATED EVERY WEEK

SOFTWARE

ALL THIRD PARTY TITLES...30% OFF

HAPPY ENHANCEMENT

810 ENHANCEMENT.....	\$159.95
1050 ENHANCEMENT.....	\$159.95
1050 CONTROLLER.....	\$39.95
ANALOG UPGRADE.....	\$49.95
WARP DOB XL.....	CALL
OTHER HAPPY PRODUCTS.....	CALL

AXLON RAMPOWER

128K RAM DISK.....	\$259.95
48K RAMPOWER.....	\$79.95
32K RAMPOWER.....	\$59.95

ICD INC.

SPARTA DOB.....	\$34.95
UB DOUBLER.....	\$59.95
CHIP FOR 810.....	\$89.95
HAPPY ARCHIVER.....	\$49.95
R-TIME CARTRIDGE.....	\$69.95
NEW PRODUCTS.....	CALL

ATARI

1050 DISK DRIVE.....	\$159.95
1050 W/HAPPY INSTALLED.....	\$379.95
LIGHT PEN.....	\$49.95
NUMERIC KEY PAD.....	\$39.95
TOUCH TABLET.....	\$49.95
800XL.....	\$99.95
520BT.....	\$379.95
500K FLOPPY DRIVE.....	\$199.95
15HD HARD DRIVE.....	CALL
850 INTERFACE.....	\$109.95
130XE 128K.....	\$159.95
830 MODEM.....	\$59.95

MISC. MERCHANDISE

PRINTERS (MOST BRANDS).....	CALL
MODEMS.....	CALL
809Y PRODUCTS.....	CALL
MONITORS.....	CALL
08/00 LIFETIME DISK (50).....	\$79.95
PRINTER INTERFACES.....	CALL
DISK DRIVES.....	CALL
OHVIVIEW.....	CALL

ALL PRICES ARE FOR MAIL ORDERS ONLY. ADD 10% FOR C.O.D. AND 15% FOR CREDIT CARD ORDERS. DEALER INQUIRIES WELCOME. SEND FOR OUR FREE BROCHURE AND PRICE LIST. ADD \$5 FOR SHIPPING, HANDLING AND INSURANCE. FOREIGN ORDERS WELCOME WITH SUFFICIENT POSTAGE INCLUDED. MOST ORDERS RECEIVED BEFORE NOON FILLED SAME DAY. ADD \$5 FOR SHIPMENT BY AIR

SOUTHERN SOFTWARE DIVISION OF SOUTHERN SUPPLY CO.

1879 Ruffner Rd. Birmingham, AL 35210
PHONE 205-956-0986

SEND SELF ADDRESSED STAMPED ENVELOPE FOR
OUR TOP 50 SPECIAL SHEET UPDATED EVERY WEEK

YOGA BREATHING continued

Don't type the
TYPO II Codes! 

```
X5 8100 55(6,14)="SOUND ON"
ZN 8110 55(66,74)="COUNT 1":COUNT=1
LK 8120 55(126,134)="INHALE=1
AF 8130 55(186,194)="RETAIN=0"
```


```
AK 8140 55(246,254)="EXHALE=1
XN 8900 REM DISPLAY/SOUND SUBROUTINE
UM 9000 SOUND 0,(OFS-10)/3,2,1:POSITION 0
,5:? #6;55:SOUND 0,0,0,0:JIF=0:RETURN
```

spectacular three-dimensional visuals

GRAPH 3-D

Article on page 46

LISTING 1

Don't type the
TYPO II Codes! 

```
GG 10 REM GRAPH 3-D LOADER
CX 20 REM BY PAUL CHABOT
FW 30 REM (C) 1985, ANTIC PUBLISHING
XQ 40 GOSUB 290:LBL=1536:IO=1704
TF 50 FOR I=1536 TO 1750
DY 60 READ X:POKE I,X:NEXT I
KD 70 RUN "D:GRAPH3D.BAS"
XY 80 REM PRINT TEXT IN GR.8, LOAD AT 153
6
50 90 DATA 104,201,4,240,9,170,240,5,104,
104,202,208
```

```
DB 100 DATA 251,96,104,133,215,104,133,21
4,104,104,168,104
TY 110 DATA 133,217,104,133,216,104,104,2
40,236,133,212,24
VN 120 DATA 165,214,101,88,133,214,165,89
,101,215,133,215
MY 130 DATA 152,240,15,165,214,105,64,133
,214,165,215,105
MU 140 DATA 1,133,215,136,208,241,132,221
,168,0,132,220
```

continued on next page


```

WL 150 DATA 177,216,160,0,170,16,1,136,13
2,213,138,41
CG 160 DATA 96,208,4,169,64,16,14,201,32,
208,4,169
ZR 170 DATA 0,16,6,201,64,208,2,169,32,13
3,218,138
IL 180 DATA 41,31,5,218,133,218,169,0,162
,3,6,218
DI 190 DATA 42,202,208,250,109,244,2,133,
219,164,221,177
EG 200 DATA 218,69,213,164,220,145,214,20
0,132,220,196,212
AL 210 DATA 208,182,24,165,214,105,40,133
,214,144,2,230
VY 220 DATA 215,230,221,169,8,197,221,200
,159,96,207,96
WC 230 REM BYTE I/O, LOAD AT 1704
NA 240 DATA 169,64,133,212,169,3,133,213,
104,104
MF 250 DATA 104,10,10,10,10,170,216,24,10
5,9
EL 260 DATA 168,104,145,212,136,104,145,2
12,136,136
CI 270 DATA 136,104,145,212,136,104,145,2
12,136,136
KT 280 DATA 104,104,145,212,76,86,228
UU 290 GRAPHICS 2:POKE 712,176:POKE 710,1
76:POKE 752,1
ID 300 POSITION 3,1
XL 310 ? #6;"R P 3 "
KR 320 POSITION 4,4
SF 330 ? #6;"Paul Chabot"
NF 340 ? :? :? " (c) 1985, Antic Publi
shing":RETURN

```

LISTING 2

```

UD 10 REM GRAPH 3-D, LISTING 2
CX 20 REM BY PAUL CHABOT
FW 30 REM (C) 1985, ANTIC PUBLISHING
EI 35 IF PEEK(1536)<>104 THEN RUN "D:GR3D
LOAD.BAS"
IG 40 GOTO 2000
RF 100 REM **** THE FUNCTION ****
BR 120 Z=X*X-Y*Y/2
ZD 130 RETURN
YJ 150 REM **** FIND SX,SY ****
NX 152 QX=QX-FX:QY=QY-FY:QZ=QZ-FZ
PF 154 SX=QX*A1+QY*A2+QZ*A3
VX 156 SY=QX*A4+QY*A5+QZ*A6
CP 158 SZ=QX*A7+QY*A8+QZ*A9
IX 160 X=ED-SZ:IF X<1 THEN X=1
OK 162 T=(M*ED)/(X*X)
FC 164 SX=T*SX+CX:SY=CY-T*SY
VD 166 IF SX<0 THEN SX=0
SZ 168 IF SX>319 THEN SX=319
VP 170 IF SY<0 THEN SY=0
QH 172 IF SY>191 THEN SY=191
ZX 174 RETURN
ZC 200 REM **** COMPUTE POINTS ****
YE 202 TRAP 800:POSITION 21,14
AL 204 ? " COMPUTING POINTS "
KI 212 DX=(BX-AX)/NX:DY=(BY-AY)/NY
SQ 214 X=AX-DX:C=132
OZ 216 FOR I=0 TO NX:X=X+DX:Y=AY-DY
MB 218 FOR J=0 TO NY:Y=Y+DY:GOSUB 100
PM 224 PX(I,J)=X:PY(I,J)=Y:PZ(I,J)=Z
OH 226 C=C+2:IF C>255 THEN C=0
KE 228 POKE 708,C:NEXT J:NEXT I
SI 230 POKE 708,132
ZK 232 RETURN
RI 300 REM **** GRAPH IT ****
VE 302 IF CF=1 THEN GOSUB 200:GOSUB 400
XH 304 GRAPHICS 24:GOSUB 1560:COLOR 1
XH 306 CF=0:GOSUB 1180:SI=1:SJ=1
WI 310 IF GF=1 THEN SJ=NY

```

```

VK 312 IF GF=2 THEN SI=NX
EN 314 IF GF=3 THEN SJ=3
EL 316 IF GF=4 THEN SI=3
TO 318 IF GF=5 THEN SI=3:SJ=3
LT 329 REM PERP. TO X-AXIS
MH 330 FOR I=0 TO NX STEP SI
TM 332 FOR J=0 TO NY:QX=PX(I,J)
QX 334 QY=PY(I,J):QZ=PZ(I,J):GOSUB 150
IZ 336 IF J=0 THEN PLOT SX,SY
WY 338 DRAWTO SX,SY:NEXT J:NEXT I
MN 339 REM PERP. TO Y-AXIS
OI 340 FOR J=0 TO NY STEP SJ
SP 342 FOR I=0 TO NX:QX=PX(I,J)
OZ 344 QY=PY(I,J):QZ=PZ(I,J):GOSUB 150
IT 346 IF I=0 THEN PLOT SX,SY
XH 348 DRAWTO SX,SY:NEXT I:NEXT J
GO 350 GOSUB 1180:RETURN
QZ 400 REM **** FIX MATRIX ****
YG 402 TRAP 800:POSITION 21,14
TZ 404 ? " fixing matrix "
NI 406 X=(AX+BK)/2:Y=(AY+BY)/2
RN 408 GOSUB 100
MA 410 FX=X:FY=Y:FZ=Z
LF 412 A7=EX-FX:A8=EY-FY:A9=EZ-FZ
NK 414 ED=SQR(EX*EX+EY*EY+EZ*EZ)
PU 416 A7=A7/ED:A8=A8/ED:A9=A9/ED
YO 418 A6=A7*A7+A8*A8
WI 420 IF A6=0 THEN A4=0:A5=1:GOTO 430
GK 422 IF A9=0 THEN A4=0:A5=0:A6=1:GOTO 4
30
SE 424 IF A9<0 THEN A4=A7:A5=A8:A6=-A6/A9
:GOTO 430
WA 426 A4=-A7:A5=-A8:A6=A6/A9
WS 430 A1=A5*A9-A6*A8
WD 432 A2=A6*A7-A4*A9
VO 434 A3=A4*A8-A5*A7
PT 436 XX=SQR(A4*A4+A5*A5+A6*A6)
TB 438 A4=A4/XX:A5=A5/XX:A6=A6/XX
AY 440 XX=SQR(A1*A1+A2*A2+A3*A3)
HA 442 A1=A1/XX:A2=A2/XX:A3=A3/XX
ZU 444 RETURN
JU 480 REM **** INPUT=[RETURN] ****
MG 482 IF PEEK(764)=255 THEN 482
ZV 484 IF PEEK(764)<>12 THEN RETURN
CJ 486 POKE 764,255:POP:RETURN
TO 500 REM **** MAG CHANGE ****
FO 502 ? "MAGNIFICATION":?
IR 504 ? " MAG=";M;" INPUT ";
TM 506 GOSUB 480:INPUT M:GOSUB 1120
ZZ 508 RETURN
UE 520 REM **** OPTION FLAG ****
CV 522 GF=GF+1:IF GF>5 THEN GF=0
EJ 524 POSITION 13,3:GF:RETURN
CG 550 REM **** EYE CHANGE ****
HO 552 ? "HORIZONTAL POSITION":?
AP 554 ? ES;" EX,EY,EZ"
QL 556 ? BLS(28);"INPUT ";:GOSUB 480
TS 558 INPUT EX,EY,EZ:GOSUB 1130
JB 560 GOSUB 400:RETURN
CL 600 REM **** INTERVAL CHANGE ****
WV 602 ? "INTERVALS":?
TH 604 ? IS;" AX,BX,AY,BY"
QC 606 ? BLS(28);"INPUT ";:GOSUB 480
LP 608 INPUT AX,BX,AY,BY:GOSUB 1140
QC 610 CF=1:RETURN
PJ 620 REM **** PARTITION SIZE ****
IC 622 ? "PARTITION SIZE":?
RC 624 ? " NX,NY = ";NX;"",NY
EK 626 ? " INPUT ";:GOSUB 480
QA 628 INPUT NX,NY:IF NX<3 THEN NX=3
BC 630 IF NX>N THEN NX=N
UK 632 IF NY<3 THEN NY=3
CO 634 IF NY>N THEN NY=N
QY 636 CF=1:RETURN
JX 650 REM **** CENTER CHANGE ****
QM 652 ? "CENTER POSITION":?
PK 654 ? " CX,CY = ";CX;"",CY
EQ 656 ? " INPUT ";:GOSUB 480
LD 658 INPUT CX,CY:RETURN
EE 700 REM **** FUNCTION CHANGE ****

```



```

ET 702 ? "NEWFUNCTION":?
RR 704 ? Z$:? "Z=":GOSUB 480:ZB$=Z$
SO 706 INPUT A$:Z$="Z=":Z$(3)=A$
QA 708 GOSUB 720:CF=1:RETURN
TY 720 REM ***** CREATE LINE 120 *****
ZI 722 GOSUB 1100:?"120 ":Z$:?" :?"CONT"
;
NN 724 POSITION 2,16:POKE 842,13:STOP
TE 726 POKE 842,12:RETURN
PM 750 REM ***** RECOVER LAST FUNCTION **
ID 752 ? "RECOVERLASTFUNCTION":?
KA 754 ? "RECOVERLASTFUNCTION Y/N"
XV 756 ? "*** current will die ***";
FN 758 L=PEEK(764):IF L=255 THEN 758
IL 760 POKE 764,255:IF L<>43 THEN RETURN
YV 762 A$=Z$:Z$=ZB$:ZB$=A$
QA 764 GOSUB 720:CF=1:RETURN
AO 800 REM ***** VALUE ERROR TRAP *****
EU 802 GOSUB 1580:POSITION 21,14
DT 804 ? "*****GONON*****":POP :POP
WY 806 POKE 764,255:POSITION 2,16
BB 808 ? "*****GONON***** - to recov
er "
GA 810 IF PEEK(764)=255 THEN 810
ZM 812 RETURN
LK 840 REM ***** I/O TRAP *****
FC 842 GOSUB 1580:POSITION 21,14
EK 844 CLOSE #2:?"*****GONON*****"
RZ 846 GOTO 806
NS 850 REM ***** DISK DIRECTORY *****
MK 852 TRAP 840:POKE 82,21:POSITION 21,3
QN 854 FOR J=1 TO 10:?" BL$(22):NEXT J
QA 856 POSITION 21,3
WG 858 CLOSE #2:OPEN #2,6,0,"D:*.G3D"
YM 860 FOR J=1 TO 10:FOR I=0 TO 1
IX 862 INPUT #2,A$:IF LEN(A$)=16 THEN 870

VM 864 ? A$(3,10):?" ":NEXT I:?" :NEXT J
CE 870 CLOSE #2:POSITION 21,13:?" A$
ZK 872 POKE 82,2:RETURN
NG 880 REM ***** GET FILENAME *****
IZ 882 ? "*****GONON*****":FIS(3)
RU 884 ? " INPUT filename ":GOSUB 480
VC 886 INPUT A$:FIS="D:":FIS(3)=A$
HB 888 FIS(LEN(FIS)+1)="G3D":RETURN
IC 890 REM ***** 2ND CHANCE *****
KF 891 GOSUB 2190:?" *****GONON***** Y/N"
GC 892 ? " filespecs ":FIS
GL 894 L=PEEK(764):IF L=255 THEN 894
WH 896 POKE 764,255:IF L=43 THEN RETURN
WE 898 POP :RETURN
GI 900 REM ***** SAVE TO DISK *****
GT 902 ? " S A V E":GOSUB 880
CK 904 GOSUB 890:GOSUB 1560:TRAP 840
BS 906 OPEN #2,8,0,FIS:POKE 1913,80
HR 908 X=USR(IO,2,7680,SA1,11)
LJ 910 ? #2:Z$:?" #2:M
JX 912 ? #2:EX:?" #2:EY:?" #2:EZ
CX 914 ? #2:AX:?" #2:BX
EH 916 ? #2:AY:?" #2:BY
FO 918 ? #2:CX:?" #2:CY
QO 920 ? #2:NX:?" #2:NY
DA 922 CLOSE #2:POKE 1913,87
DL 924 GOSUB 1580:GOSUB 850:RETURN
FK 930 REM ***** LOAD FROM DISK *****
ME 932 ? " L O A D":?" :GOSUB 880
CO 934 GOSUB 890:GOSUB 1560:TRAP 840
NR 936 ZB$=Z$:OPEN #2,4,0,FIS
FC 938 X=USR(IO,2,7680,SA1,7)
JL 940 INPUT #2:Z$:INPUT #2:M
NH 942 INPUT #2:EX:INPUT #2:EY:INPUT #2:E
Z
CV 944 INPUT #2:AX:INPUT #2:BX
ER 946 INPUT #2:AY:INPUT #2:BY
GK 948 INPUT #2:CX:INPUT #2:CY
HM 950 INPUT #2:NK:INPUT #2:NY
DE 952 CLOSE #2:GOSUB 1580
KG 954 GOSUB 1120:GOSUB 1130:GOSUB 1140
QG 956 GOSUB 720:CF=1:RETURN
IU 958 REM ***** PRINT IT *****
HK 961 ? " PRINT IT ":?

```

```

ET 962 ? " TITLE ":FIS(3):?
HL 963 ? " 1-LEFT 2-RIGHT"
CU 964 K=PEEK(764):IF K=255 THEN 964
XD 966 POKE 764,255:TRAP 840
LY 968 IF K<>31 AND K<>30 THEN RETURN
HM 970 CLOSE #2:OPEN #2,8,0,"P:"
DC 971 REM INITIALIZE
EJ 972 ? #2:CHR$(27);CHR$(64);
SS 973 REM FILENAME
WY 974 IF K=30 THEN ? #2:BL$:
HD 976 ? #2:CHR$(14):?" ":FIS(3)
GO 977 REM SET LINE FEED
IM 978 ? #2:CHR$(27);CHR$(51);CHR$(16)
SA 980 X=SA1+192*40
GU 982 FOR I=0 TO 39:T=X+I
DZ 984 FOR J=1 TO 192:T=T-40
XU 986 BS(J,J)=CHR$(PEEK(T)):NEXT J
YM 987 REM PRINT GRAPHICS STRING
XM 988 IF K=30 THEN ? #2:BL$:
QJ 990 ? #2:CHR$(27);CHR$(75);CHR$(192);C
HR$(0);BS
GX 992 NEXT I
IV 994 CLOSE #2:RETURN
KO 1100 REM ***** FORCED READ *****
VF 1102 POSITION 2,18:?" BL$
YR 1104 POSITION 2,18:RETURN
HL 1110 POSITION 1,18
VW 1112 POKE 842,13:INPUT A$
UR 1114 POKE 842,12:RETURN
UC 1120 REM ***** FILL MS
PP 1122 GOSUB 1100:?" MAG:":M
ZE 1124 GOSUB 1110:MS=A$:RETURN
QB 1130 REM ***** FILL ES
XP 1132 GOSUB 1100
SD 1134 ? "EYE:":EX:?" ":EY:?" ":EZ
UJ 1136 GOSUB 1110:ES=A$:RETURN
RG 1140 REM ***** FILL IS
XS 1142 GOSUB 1100
KO 1144 ? "[:AX:":":BX:"]*[:AY:":":BY:"]
]
XC 1146 GOSUB 1110:IS=A$:RETURN
EL 1150 REM ***** FILL Z$
CF 1152 GOSUB 1100:POSITION 2,17:LIST 120

GR 1154 GOSUB 1110:Z$=A$(5):RETURN
CY 1180 REM ***** LABEL SCREEN *****
SG 1182 X=USR(LBL,32,2,ADR(MS),LEN(MS))
IT 1184 X=USR(LBL,0,23,ADR(IS),LEN(IS))
XT 1186 X=USR(LBL,22,23,ADR(ES),LEN(ES))
IP 1188 L=LEN(Z$):IF L>40 THEN L=40
DP 1190 X=USR(LBL,0,0,ADR(Z$),L)
JZ 1192 IF LEN(Z$)<41 THEN RETURN
RB 1194 X=USR(LBL,0,1,ADR(Z$)+40,LEN(Z$)-
40)
CA 1196 RETURN
EA 1500 REM *****SETUP 2 SCREENS *****
BG 1502 RAM=PEEK(106):GRAPHICS 24:MOD1=8
CZ 1504 DL1L=PEEK(560):DL1H=PEEK(561)
OU 1506 SA1L=PEEK(88):SA1H=PEEK(89)
HI 1508 SA1=SA1L+256*SA1H
IH 1510 POKE 106,RAM-33:GRAPHICS 0:MOD2=0

DZ 1512 DL2L=PEEK(560):DL2H=PEEK(561)
PT 1514 SA2L=PEEK(88):SA2H=PEEK(89)
XG 1516 DL=DL2L+256*DL2H:POKE 106,RAM
QR 1518 POKE DL+3,71:POKE DL+6,6
TZ 1520 POKE DL+8,64:POKE DL+21,6
FJ 1522 POKE DL+22,6:POKE DL+24,48
BF 1524 RETURN
MV 1560 REM ***** SCREEN 1 - PICTURE *****
EI 1562 POKE 560,DL1L:POKE 561,DL1H
SA 1564 POKE 88,SA1L:POKE 89,SA1H
DC 1566 POKE 709,26:POKE 710,0:POKE 712,1
28
PL 1568 POKE 87,MOD1:RETURN
EI 1580 REM ***** SCREEN 2 - MENU *****
GK 1582 POKE 560,DL2L:POKE 561,DL2H
TZ 1584 POKE 88,SA2L:POKE 89,SA2H
JV 1586 POKE 709,24:POKE 710,194:POKE 712

```

continued on next page



Vastly SUPERIOR to any translation programs available! FOR ATARI 1200XL/600XL/800XL with 64K.
(Please specify computer model number!)

\$69.95 (Rom)
\$49.95 (D or C)

THE XL "FIX"!



\$69.95 (Rom)
\$49.95 (D or C)

The Atari XL series computers represent power, sophistication, and flexibility virtually unrivalled in today's Home Computer Market.

With "approximately" 30-40% of existing software being "incompatible", a real, and serious problem exists. Because of this we have developed THE XL "FIX"!

ADVANTAGES over cheaper "translation products":

1. The XL "FIX"! is capable of fixing more software... an estimated **30% more software!**
2. The XL "FIX"! is available in **DISK, CASSETTE**, and now **ROM!**
3. XL "FIX"! versions fix ALL THREE types of software (Disk - Cassette - and Cartridges!)
4. The XL "FIX"! (disk or cassette) adds **OVER 4K** of usable RAM to your computer (anyone using Data bases or Word processors will **really** appreciate this feature!)
5. You never have to hold the **OPTION** button down on 600XL or 800XL computers!
6. **VERY IMPORTANT!** You need to load the XL "FIX"! only **once**... you can **change** disks, cassettes, or cartridges **without** rebooting the XL "FIX"! each time (disk or cassette!)
7. The **ROM** version is instantaneous upon computer power up, has a high speed cursor, is instantly switchable to your original operating system, will work with 16K 600XL's, and more!

The XL "FIX"!... another SUPERIOR product! **64K required!**

DISTRIBUTOR/DEALER inquiries welcome

Mastercard-Visa-Money
Order or Cashier Check.
Phone **(716) 467-9326**
Please specify computer model number!

Send \$49.95 (\$69.95 for Rom)
plus \$4 shipping and handling
(N.Y.S. residents please add 7%) to:
COMPUTER SOFTWARE SERVICES
P.O. Box 17660
Rochester, New York 14617



THREE NEW PRODUCTS!

THE "SUPER PILL"!

Exactly the same as the WORLD'S leading cartridge backup device... **THE PILL!**... except it's even simpler to operate, it's **SWITCHLESS!** Excellent for families having young children. Totally eliminates opening computer doors and switches. **THE "SUPER PILL"!** is the most advanced state of the **CARTRIDGE BACKUP** device available today. It is totally compatible with all ATARI computers and all programs backed up by the original "PILL"! Only \$79.95 plus \$4 shipping and handling.

THE "PROTECTOR/SILENCER"!

The **"PROTECTOR"!** is a disk and hardware modification (no soldering) for Atari 810, 1050, and Indus GT disk drives that will allow you to write true **BAD SECTORS** wherever you wish (not to be confused with ridiculous speed control or tape jerking schemes!). **Powerful** disk program finds hidden directories, scrambles existing directories, fast maps, hex conversions, disk dupes, and much more!

The **"SILENCER"!** quiets your drive tremendously (eliminates the **LOUD** grinding noise when you read a bad sector!), **PLUS** it allows you to **WRITE TO BOTH SIDES** of any disk **WITHOUT** cutting or notching the disk! Both for only \$49.95 plus \$4 shipping and handling.

THE "COMPANION"!

An amazing device that will enhance the capabilities of the **XL "FIX"!** or Atari Translator. It will allow you to **de-select BASIC** (no more need to hold the **OPTION** button while loading programs on the 600XL's and 800XL's), and it will allow you to **de-select the DIAGNOSTICS** (no more bad loads because of the **DIAGNOSTICS** jumping into the middle of your program load routine!). Installation is simple (10 minutes) and requires **NO** soldering! Only \$29.95 plus \$4 shipping and handling.

DISTRIBUTOR/DEALER inquiries welcome.

Our other fine products include THE "PILL!", XL "FIX!", "IMPOSSIBLE!", "METAMORPHOSES!", and "REMOTE!"

Mastercard-Visa-Money
Order or Cashiers Check.

Phone orders:
(716) 467-9326.
Atari is a TM of Atari Inc. The
"METAMORPHOSES" is a TM
of Computer Software
Services (division of S.C.S.D.,
Inc.)

COMPUTER SOFTWARE SERVICES
P.O. Box 17660
Rochester, New York 14617



\$149.95

For years they said it couldn't be done... **THE "IMPOSSIBLE"!** they claimed!

Backup almost any disk currently available (even **heavily protected** programs) with an **UNMODIFIED** disk drive!
Works with **ANY** disk drive!



\$149.95

PURPOSE: The **"IMPOSSIBLE"!** was developed in response to the estimated half million disk drive users that own a drive other than the Atari 810 (Indus, Percom, Trak, Rana, Astra, etc.) that wish to **BACK UP their protected software.** Due to a radically new technology developed by Computer Software Services, modification to your disk drive has been eliminated! The advantages are obvious! Drive warranties are not violated, the chance accidental damage has been eliminated, etc., etc.

OPERATION: The **"IMPOSSIBLE"!** consists of a disk program (**unprotected** so you can make as many backups as you wish) and a 4K STATIC RAM pack which is inserted into your computer (no soldering!) The **"IMPOSSIBLE"!** will read your program disk and then **re-write it in an unprotected format!** You may make additional backup copies using a sector copier or even regular DOS! Because your backup copy no longer has **BAD SECTORS** or **EXOTIC FORMATS**, the program data can now be manipulated into DOS compatible files (even double density!), transferred to cassette, etc. (with the aid of our Satellite programs!) No user programming knowledge required. A few programs require logical thinking.

- FEATURES:**
- | | |
|--|--|
| 1. Backup protected disks | 5. AFSD-Automatic FUZZY Sector Discriminator |
| 2. Handles most MULTI-LOAD programs | 6. Expands computer memory to 52K usable |
| 3. Makes DOS files (with Satellite option) | 7. Simple NO SOLDER installation |
| 4. Up to 90K data input capable | 8. Satellite expandable |

PROJECTED SATELLITES: A **"COMPACTOR"** program which will convert your program into DOS compatible files (double density compatible!) for the storage of several programs on one disk. A **"COLUMN 80"** program for Word Processing, etc. It allows 80 columns on the screen! The **"XL-MATE"** will allow programs made with your 400/800 **"IMPOSSIBLE"!** to now play on your XL Computer! The **METAMORPHOSES II** program will allow you to convert your **protected CASSETTES** into disk DOS files and vice-versa. All satellite programs must be used with inconjunction with The **"IMPOSSIBLE"!**

REQUIREMENTS: The **"IMPOSSIBLE"!** diskette, the 4K STATIC RAM pack, a 400 or 800 computer (please specify!) with 48K and "B" Rom's. **NOTE!** The very old ATARI computers were shipped with "A" Rom's which had some serious "Bugs". Even if you don't own an **"IMPOSSIBLE,"** you should upgrade to "B" Rom's (simple to install!) We have them available at a very inexpensive price. **CALL US!** "XL" version available soon!

NOT A PIRATING TOOL: We at C.S.S. did not design The **"IMPOSSIBLE"!** to put Software Manufacturers out-of-business overnight! Nearly all of our products have been "ripped-off" by industry parasite who have little or no ability to develop a product of their own so we can sympathize with their dilemma. All C.S.S. products have built-in safe guards which prohibit their use for flagrant pirating. The **"IMPOSSIBLE"!** is no exception! While The **"IMPOSSIBLE"!** back-up the most heavily protected programs, it also checks to see that the 4K STATIC RAM pack is installed before allowing the backup copy to execute!

EXAMPLES: The **"IMPOSSIBLE"!** has been tested on 300 of the most popular and heavily protected programs we could find. With nearly 4000 programs for Atari, we DO NOT guarantee that it will backup all programs in the past-present-and future! We will supply updates at \$6 each (non-profit!) if and when necessary. Programs we have successfully backed up include: Blue Max, Visi-cal, Archon, Gule, File Manager 800 +, Syn Calc, Syn File, One on One, 7 Cities of Gold, Super Bunny, Load Runner, Drol, and Gumball just to name a few!

Mastercard-Visa-Money
Orders or Cashier Check.
Phone: **(716) 467-9326**
Please specify computer model number!

Send \$149.95 plus
\$4 shipping and handling
(N.Y.S. residents please add 7%)

COMPUTER SOFTWARE SERVICES
P.O. BOX 17660
ROCHESTER, N.Y. 14617

KZ 1220	DX 1440	NJ 1660
YB 1230	NX 1450	QD 1670
AM 1240	GW 1460	FR 1680
DR 1250	RL 1470	SO 1690
OV 1260	IU 1480	NJ 1700
QT 1270	ZZ 1490	RR 1710
BX 1280	HP 1500	EG 1720
NN 1290	PC 1510	KF 1730
KY 1300	QL 1520	DV 1740
XM 1310	CI 1530	BD 1750
MD 1320	XS 1540	OL 1760
VE 1330	LC 1550	PI 1770
WZ 1340	MD 1560	JL 1780
LO 1350	UL 1570	PP 1790
QJ 1360	YY 1580	TY 1800
FG 1370	NS 1590	FF 1810
TE 1380	OA 1600	NX 1820
RF 1390	YP 1610	KM 1830
LE 1400	EG 1620	NM 1840
PC 1410	VQ 1630	XF 1850
DB 1420	AH 1640	CE 1860
OI 1430	KE 1650	

game of the month

ALIEN ASYLUM

Article on page 31

LISTING 1

Don't type the
TYPO II Codes! 

```

UK 10 REM ASYLUM
PG 20 REM BY SPENCER CRASKE
ZF 30 REM (C) 1985, Antic Publishing Co.
EV 40 I=1:GRAPHICS 17:SETCOLOR 4,7,2:SETC
OLOR 3,0,14:SETCOLOR 0,2,14
CX 50 SETCOLOR 2,3,6:SETCOLOR 1,12,12:GOS
UB 150
CR 60 POKE 106,PEEK(740)
YU 70 SC=PEEK(88)+256*PEEK(89):MN=3:KL=5:
S=1:EG=50:NF=1:DIM IN$(4)
IB 80 DIM AS$(50):AS$="      00000 00000 000
00 00000 00"
FN 90 DIM BS$(50):BS$="0000 00000 00000 0000
0 00000 00"
BZ 100 DIM CS$(50):CS$="0000 00000 00000 000
00 00000 00"
JG 110 POSITION 0,21:? #6;"score:      k
eys:" :POSITION 0,22:? #6;"men:   level:
S0:"
PK 120 NTOP=PEEK(106)-10:POKE 106,NTOP:NS
ET=NTOP*256:DIM CMS(32)
YT 130 CMS$="hhhhhhhhhhhhhhhhhhhhhhhhhhhhhh
hhhh"
NG 140 CM=USR(ADR(CMS),57344,NSET):POKE 7
56,NTOP:GOTO 170
SJ 150 POSITION 6,I-1:? #6;"      ":POSITI
ON 5,I+1:? #6;"      "
NH 160 POSITION 6,I:? #6;"alien":POSITION
5,I+2:? #6;"ASYLUMS":RETURN
HB 170 FOR T=0 TO 47:READ A:POKE NSET+8+T
,A:NEXT T
IG 180 FOR X=0 TO 419:POKE SC+X,6:NEXT X:
COLOR 130:PLOT 0,0:DRAWTO 19,0:DRAWTO
19,20:DRAWTO 0,20:DRAWTO 0,0
JM 190 X=10:Y=9:PX=10:PY=Y:GOSUB 420
PR 200 Q=PEEK(632):LY=(Q=13)-(Q=14):LX=(Q
=7)-(Q=11)
KL 210 IF LX=0 AND LY=0 THEN LY=OLY:LX=OL
X
WR 220 OLX=LX:OLY=LY
HX 230 POSITION 1,10:? #6;CS$(5,5+17):POSI
TION 1,15:? #6;BS$(5,5+17)
WZ 240 POSITION 1,5:? #6;AS$(5,5+17)
ZM 250 IF 5+17=LEN(AS$)-1 THEN R=0
AR 260 IF S=1 THEN R=1
MD 270 IF PEEK(20)>=110-(10*KL) THEN S=S+
(R*2)-1:POKE 20,0
BS 280 Y=Y+LY:X=X+LX:LOCATE X,Y,C:IF C=30
THEN SOUND 0,250,10,10:SOUND 0,0,0,0:
SR=SR+10:B=B+1:EG=EG+2
IY 290 IF C=130 THEN X=PX:Y=PY:LOCATE X,Y
,C
PL 300 IF Y=5 OR Y=10 OR Y=15 THEN IF C=1
63 OR C=164 THEN GOSUB 630
GE 310 IF C=1 THEN K=K+1:SR=SR+100:FOR I=
0 TO 30:SOUND 0,RND(0)*255,10,14:NEXT
I:SOUND 0,0,0,0
IH 320 COLOR 32:PLOT PX,PY:COLOR 133:PLOT
X,Y:PX=X:PY=Y
UI 330 EG=EG-1:IF EG<=0 THEN GOSUB 630
HG 340 IF G=0 THEN IF SR>=10000 THEN G=1:
MN=MN+1
WT 350 IF EG>99 THEN EG=99
TB 360 POSITION 18,21:? #6;"      "
PS 370 POSITION 6,21:? #6;SR:POSITION 18,
21:? #6;KL-K:POSITION 4,22:? #6;MN:POS
ITION 12,22:? #6;LVL
LP 380 POSITION 18,22:? #6;"      ":POSITION
18,22:? #6;EG
AX 390 POKE NSET+52,NF:NF=NF*2:IF NF>128
THEN NF=1
WL 400 IF K=KL THEN LVL=LVL+1:S=1:KL=5+LV
L:K=0:I=0:GOTO 670
LV 410 GOTO 200

```



```

GA 420 POSITION 1,10:? #6;C5(5,5+17):POSIT
TION 1,15:? #6;B5(5,5+17):POSITION 1,5
:? #6;A5(5,5+17)
CK 430 FOR T=1 TO KL
VP 440 COLOR 1:R=INT(RND(0)*20):RR=INT(RN
D(0)*20):LOCATE R,RR,C:IF C<>38 THEN 4
40
SP 450 PLOT R,RR:NEXT T:RETURN
KV 460 SOUND 1,0,0,0:SOUND 0,0,0,0:FOR X=
0 TO 419:POKE 5C+X,0:NEXT X
TU 470 POSITION 0,4:? #6;" you have achie
ved      :LVL:IF SR>=HISC THEN H
ISC=SR
LQ 480 CLOSE #1
GZ 490 IF HISC=SR THEN ? #6;"ENTER INITIA
LS":OPEN #1,4,0,"K:":GOTO 510
MY 500 IN=0:GOTO 560
WS 510 C=1:IN$=""   ":TRAP 510
ML 520 IF C<1 OR C>4 THEN 510
NI 530 GET #1,IN:IF IN=155 THEN 570
FC 540 IF IN=254 OR IN=126 OR IN=30 THEN
IN$(C)=""   ":C=C-1:POSITION 7+C,12:? #
6;" ":GOTO 520
FG 550 IN$(C,C)=CHR$(IN):C=C+1
BQ 560 POSITION 0,10:? #6;"HI-SCORE IS ";
HISC;" BY:":POSITION 8,12:? #6;IN$(1,3
):IF IN<>0 THEN 520
WI 570 POSITION 3,20:? #6;"PRESS TRIGGER"
EH 580 CR=8

```

```

VX 590 CR=CR-121*(CR>120)+1:FOR X=708 TO
711:POKE X,CR+32*(X-708):NEXT X:IF STR
IG(0) THEN 590
XN 600 SETCOLOR 4,7,2:SETCOLOR 3,0,14:SET
COLOR 0,2,14:SETCOLOR 2,3,6:SETCOLOR 1
,12,12
QA 610 OLX=0:OLY=0:LVL=0:SR=0:K=0:KL=5:S=
1:MN=3:EG=50:POSITION 6,21
EG 620 ? #6;"      ":GOTO 180
FO 630 COLOR 32:PLOT PX,PY:COLOR 37:PLOT
X,Y
MH 640 MN=MN-1:X=10:Y=9:FOR T=100 TO 0 ST
EP -1:SOUND 0,T+75,10,15:SOUND 1,(100-
T)+75,10,15:NEXT T:IF MN=-1 THEN 460
DV 650 SOUND 0,0,0,0:SOUND 1,0,0,0
MR 660 OLX=0:OLY=0:EG=50:RETURN
JD 670 FOR I=1 TO 5:CM$(I,I)=CHR$(PEEK(70
7+I)):NEXT I:FOR I=0 TO 9
XH 680 FOR Y=708 TO 712:POKE Y,PEEK(Y)+I:
NEXT Y:NEXT I
ZJ 690 FOR I=1 TO 5:POKE 707+I,ASC(CM$(I,
I)):NEXT I
OL 700 OLX=0:OLY=0:EG=50:GOTO 180
AM 710 DATA 7,5,253,165,165,7,0,0,0,60,12
6,126,126,126,60,0,124,84,254,146,214,
0,0,0,124,214,214,124,56
KY 720 DATA 124,84,0,16,84,56,238,56,84,1
6,0,0,0,0,0,16,0,0,0

```

bonus game

LEMONADE

Article on page 32

LISTING 1

Don't type the
TYPO II Codes! 

```

TR 5 REM LEMONADE
DT 10 REM BY BOB POLARO
BP 12 REM ANTIC PUBLISHING
JO 15 OPEN #1,4,0,"K:":OPEN #3,4,0,"S:":G
OTO 40
SS 20 FOR Z9=1 TO 10:NEXT Z9:SOUND 2,0,0,
0:RETURN
HW 30 POSITION 0,11:? #6;B$;B$::POSITION
0,11:RETURN
VC 40 DIM IS(5),XS(20),P(8),B$(20)
PW 50 GRAPHICS 17
JP 60 B$=""   ":GOTO 110
CF 70 SETCOLOR 4,0,0:SOUND 3,100,80,10:FO
R Z9=1 TO 20:NEXT Z9:SOUND 3,0,0,0:RET
URN
YA 80 RESTORE 90:POSITION 1,13:? #6;"
XXXXXXXXXXXXXXXXXXXX":FOR I=1 TO 8:READ XS:P
RINT #6;" ":XS:NEXT I:RETURN
ZJ 90 DATA Signs,made,sold,price,income,e
xpenses,profit,assets
UR 100 AS=INT(H*XS+H4):RETURN
EP 110 S2=30:P(8)=2:S3=0.15:H=100:H4=0.5:
C=2
BC 120 PRINT #6;"      lemonade"
NY 130 D=D+1
SM 140 FOR I=5 TO 7:POSITION 0,I:PRINT #6
;B$::NEXT I
HR 150 POSITION 0,2:P(3)=0:? #6;" DAY ";D

EP 160 O8=P(8):GOSUB 700
TU 170 ? #6;" ASSETS:":XS;" "
DP 180 C3=0:XS="" :GOSUB 760:IF RN>5 THEN
220
PK 190 RESTORE 200:FOR I=1 TO RN:READ XS,
C3:NEXT I
DE 200 DATA teamsters strike,4,lemon shor
tage,6

```

```

CJ 210 DATA Prices down,-4,supply increas
e,-4,i n f l a t i o n,2
PM 220 C=C+C3:IF C<2 THEN C=2
UR 230 C1=C*0.01
UM 240 POSITION 0,4:? #6;" COST/GLASES":
IS=STR$(C/100):IF LEN(IS)<4 THEN IS(4,
4)="0"
AH 250 ? #6;IS(2,4):R=1:P(4)=0:P(1)=0:IF
XS<>"" THEN ? #6;" ":XS
SY 260 GOSUB 760:RR=RN
JH 270 IF RN=1 THEN ? #6;" a chance of ra
in":R=0.5
VC 280 IF RN=2 THEN ? #6;" roadwork today
":R=0:SOUND 3,100,60,100
IB 290 IF RN=3 THEN ? #6;" new a r t i c l e
":R=2
GY 300 POSITION 0,8:? #6;" NO. OF GLASSES
--":X=16:Y=8:L=2:M0=18:GOSUB 740:? #6
;" ":SOUND 3,0,0,0:IF BAD=1 THEN 300
FS 310 IF I0>99 THEN 300
HK 320 XS=I0*C1:GOSUB 100:X1=AS:XS=P(8):G
OSUB 100
CT 330 IF X1<=AS THEN 350
FO 340 GOSUB 690:GOTO 300
HW 350 P(2)=I0:GOSUB 760:IF N0=0 THEN S3=
(RN+7)*0.01
CV 360 POSITION 0,9:? #6;" SIGN @":S3*1
00;" CENTS - ":X=17+LEN(STR$(S3*100))-
1:Y=9:L=1:M0=19:GOSUB 740
EX 365 IF BAD THEN 360
OM 370 IF I0>9 THEN 360
TM 380 O8=P(8)-P(2)*C1:XS=I0*S3:GOSUB 100
:X1=AS:XS=O8:GOSUB 100:IF X1<=AS THEN
400

```

continued on next page


```

KU 390 GOSUB 690:GOTO 360
GC 400 P(1)=I0
UD 410 POSITION 1,10:? #6;"PRICEZGLASS --
":X=13:Y=10:L=2:M0=20:GOSUB 740:? #6;"
":IF BAD THEN 410
KR 420 P(4)=I0:M7=0
PR 430 GOSUB 30:? #6;" DDDMM?(MZN)--":X=11
:Y=11:L=1:GOSUB 770:IF IS="" THEN 430
OZ 440 NO=0:IF IS(1,1)="N" THEN NO=1:GO T
0 300
QP 450 IF IS(1,1)<>"Y" THEN 430
UF 460 GOSUB 30:GOSUB 760:IF RN>5 THEN 49
0
EW 470 IF RR=1 THEN ? #6;" SRRORRRRRR":
FOR I=1 TO 40:SETCOLOR 4,0,12:GOSUB 70
:NEXT I:P(3)=0:GOSUB 30:GOTO 540
ZJ 480 IF RR=2 THEN GOSUB 30:? #6;" WORRR
RRRRRRRRRRR":? #6;" RRRRRRRR!!":P(3)
=P(2):GOTO 540
MW 490 IF P(4)>12 THEN 510
LV 500 N1=(12-P(4))/12*0.8*52+52:GO TO 52
0
ZW 510 N1=(12^2*52/P(4)^2)
XI 520 N2=R*(N1+N1*(1-EXP(-P(1)*C9)*C2))
BI 530 GOSUB 760:P(3)=INT(N2*(0.95+RN*0.1
))
YG 540 X5=P(3):GOSUB 100:X1=A5
FY 550 X5=P(2):GOSUB 100
HA 560 IF X1<=A5 THEN 580
YC 570 P(3)=P(2)
TH 580 P(5)=P(3)*P(4)*0.01:P(6)=P(1)*53+P
(2)*C1
AN 590 P(7)=P(5)-P(6):P(8)=P(8)+P(7)
VQ 600 GOSUB 80
FG 610 FOR F=1 TO 8:08=P(F):IF F=4 THEN 0
8=08/100
VU 620 GOSUB 670:NEXT F
XS 630 IF P(8)>=C1 THEN 130

```

```

JL 640 GOSUB 30:? #6;" SRRRRRRR!!":GOSUB
730
ZP 650 GOSUB 30:? #6;" PRESS start BUTTON
":GOSUB 770
QJ 660 GOTO 660
DF 670 X5=STR$(08):SG=0:IF F>3 THEN GOSUB
700:IF 08<0 THEN SG=-1
XC 680 POSITION 10,F+13:? #6;" ":P
OSITION 11+SG,F+13:? #6:X5:RETURN
RY 690 GOSUB 30:PRINT #6;" RRRRRRRRRRRR
RRR":GOSUB 730:GOSUB 30:RETURN
QH 700 IS="":IF 08*10=INT(08*10) THEN IS=
"0"
FW 710 IF 08=INT(08) THEN IS=".00"
LU 720 X5=STR$(08):X5(LEN(X5)+1)=IS:RETUR
N
KO 730 SOUND 2,29,2,7:FOR Z=1 TO 200:NEXT
Z:GOTO 20
PQ 740 BAD=0:GOSUB 770:X5=IS:TRAP 750:I0=
VAL(X5):RETURN
GI 750 BAD=1:RETURN
QU 760 RN=INT(RND(0)*10)+1:RETURN
EP 770 O=0:IS="":SOUND 2,100,100,100:GOSU
B 20
EJ 780 IF PEEK(53279)=6 THEN RUN
LS 790 IF L=20 AND PEEK(764)=255 THEN 700
SV 800 POSITION X+0,Y:GET #3,J
HC 810 POSITION X+0,Y:? #6:CHR$(J):IF PEE
K(764)=255 THEN POSITION X+0,Y:? #6;"
"
DY 820 IF PEEK(53279)=6 THEN RUN
GE 830 IF PEEK(764)=255 THEN 810
PJ 840 POSITION X+0,Y:GET #1,XX:POKE 764,
255:IF XX=155 OR XX=126 THEN RETURN
LK 850 O=O+1:IS(LEN(IS)+1)=CHR$(XX):PRINT
#6:CHR$(XX):IF O=L THEN L=20:RETURN
OR 860 GOTO 800

```

assembly language

FINE SCROLLING WORLD: PART II

Article on page 72

LISTING 1

```

0 ; FINE SCROLLING, LISTING 1
10 ; BY MARK ANDREWS
20 ; ANTIC PUBLISHING
30 ;
40      *= $3000
45      JMP INIT
50 ;
60 SDCCTL = $022F
70 ;
80 SDLSTL = $0230
90 SDLSTH = $0231
0100 ;
0110 COLOR0 = $02C4 ;05 COLOR REGISTE
R
0120 COLOR1 = $02C5
0130 COLOR2 = $02C6
0140 COLOR3 = $02C7
0150 COLOR4 = $02C8
0160 HSCROL = $0404
0162 VVBLKI = $0222 ;05 INTERRUPT VEC
TOR
0164 SYSVBV = $E45F ;INTERRUPT ENABLE
VECTOR

```

```

0166 SETVBI = $E45C ;SET VERTICAL BLA
NK INTERRUPT VECTOR
0168 XITVBL = $E462 ;EXIT VBI VECTOR
0170 TCKPTR = $2000
0180 FSCPTR = TCKPTR+1
0190      .OPT OBJ
0200 ;
0210 ; DISPLAY LIST DATA
0220 ;
0230 START
0240 LINE1 .SBYTE "      ANTIC PRESENTS
"
0250 LINE2 .SBYTE "
"
0260      .SBYTE "      fine scrolling
"
0270 LINE3 .SBYTE "      On You
r"
0280      .SBYTE " Atari      "
0290 LINE4 .SBYTE "      BY (YOUR NAME)
"
0300 ;
0310 ; DISPLAY LIST

```



```

0320 ;
0330 HLST NOP          ; ('HELLO' LIST)
0340 .BYTE $70,$70,$70
0350 .BYTE $70,$70,$70,$70,$70
0360 .BYTE $46
0370 .WORD LINE1
0380 .BYTE $70,$70,$70,$70,$57
0390 SCROLN NOP        ; (THIS IS THE LINE WE'LL SCROLL)
0400 .WORD $00         ; A BLANK TO BE FILLED IN LATER
0410 .BYTE $70,$42
0420 .WORD LINE3
0430 .BYTE $70,$70,$70,$70,$46
0440 .WORD LINE4
0450 .BYTE $70,$70,$70,$70,$70
0460 .BYTE $41
0470 .WORD HLST
0480 ;
0490 ; RUN PROGRAM
0500 ;
0510 INIT NOP          ; PREPARE TO RUN PROGRAM
0520 LDA COLOR3        ; SET COLOR REGISTER
0530 STA COLOR1
0540 LDA COLOR4
0550 STA COLOR2
0560 ;
0570 LDA #0            ; TELL ANTIC WHERE DISPLAY LIST IS
0580 STA SDMCTL
0590 LDA #HLST&255
0600 STA SDLSTL
0610 LDA #HLST/256
0620 STA SDLSTH
0630 LDA #$22
0640 STA SDMCTL
0645 JSR TCKSET        ; INITIAIZE TICKER ADDRESS
0650 ;
0660 ; FINE-SCROLLING ROUTINE
0680 LDA #42           ; # OF CHARACTERS IN SCROLL LINE
0690 STA TCKPTR
0700 LDA #8
0710 STA FSCPTR        ; NUMBER OF COLOR CLOCKS TO FINE-SCROLL
0720 ;
0730 ; ENABLE INTERRUPT
0740 ;
0750 LDY #TCKINT&255
0760 LDX #TCKINT/256
0770 LDA #6
0780 JSR SETVBI
0790 ;
0800 ; TICKER INTERRUPT
0810 ;
0820 TCKINT
0830 LDA #SCROLL&255
0840 STA VVBLKI
0850 LDA #SCROLL/256
0860 STA VVBLKI+1
0870 ;
0880 INFIN
0890 JMP INFIN         ; INFINITE LOOP
0900 ;
0910 SCROLL
0920 LDX FSCPTR        ; 8 TO START
0925 DEY
0930 DEX
0940 STX HSCROL
0950 BNE CONT
0960 LDX #8
0970 CONT NOP          ; (CONTINUE)
0980 STX FSCPTR
0990 CPX #7
1000 BEQ COARSE
1010 JMP SYSVBU
1020 COARSE
1030 LDY TCKPTR        ; NUMBER OF CHARA

```

```

CTERS TO SCROLL
1040 DEY
1050 BNE SCORSE        ; LOOP BACK TILL ENTIRE LINE IS SCROLLED
1060 LDY #42
1070 JSR TCKSET        ; RESET TICKER LINE
1080 SCORSE NOP        ; DO COARSE SCROLL
1090 STY TCKPTR
1100 INC SCROLN        ; LOW BYTE OF ADDRESS
1110 BNE RETURN
1120 INC SCROLN+1      ; HIGH BYTE OF ADDRESS
1130 RETURN
1140 JMP SYSVBU
1150 ;
1160 TCKSET
1170 LDA #LINE2&255
1180 STA SCROLN
1190 LDA #LINE2/256
1200 STA SCROLN+1
1210 ENDIT
1220 RTS
1280 *= $02E0
1290 .WORD INIT

```

LISTING 2

```

0 ; FINE SCROLLING, LISTING 2
10 ; BY MARK ANDREWS
20 ; ANTIC PUBLISHING
0190 ;
0240 LINE1 .BYTE $00,$00,$00,$21,$2E,$34,$29,$23,$00
0245 .BYTE $30,$32,$25,$33,$25,$2E,$34,$33,$00,$00,$00,$00
0250 LINE2 .BYTE $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
0255 .BYTE $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
0260 .BYTE $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
0265 .BYTE $6F,$6C,$6C,$69,$6E,$67,$00,$00,$00,$00,$00,$00
0270 LINE3 .BYTE $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
0275 .BYTE $2F,$6E,$00,$39,$6F,$75,$72
0280 .BYTE $00,$21,$74,$61,$72,$69,$00,$00,$00,$00,$00,$00
0285 .BYTE $00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00,$00
0290 LINE4 .BYTE $00,$00,$00,$22,$39,$00,$08,$39,$2F,$35,$32
0295 .BYTE $00,$2E,$21,$2D,$25,$09,$00,$00,$00

```

End Program Typing Agony Forever!



**Antic Magazine+
Disk Subscription**

**Instant Relief!
Only \$99.95
for 12 issues.**

See Subscription
Insert for details.

GEM COLOR CASCADE

Article on page 20

LISTING 1

```

VE 10 REM SINE WAVES
PB 20 REM BY PATRICK BASS
FW 30 REM (C) 1985, ANTIC PUBLISHING
PA 100 OPEN #1,4,0,"K:"
UH 110 XRES=319:YRES=191
NJ 120 FOR LOOP=0 TO 1 STEP 0
JB 130 GRAPHICS 8+16
RS 140 SETCOLOR 2,0,0:SETCOLOR 4,0,0:COLOR 1
GK 150 SINEAMPLITUDE=(RND(9)*70)+10
RZ 160 COSINEAMPLITUDE=(RND(9)*70)+10
LU 170 SINEPERIOD=(RND(9)*70)+5
CP 180 COSINEPERIOD=(RND(9)*70)+5
OQ 190 SIZE=(RND(9)*5)+1

FH 200 FOR XPOINT=0 TO XRES STEP SIZE
XZ 210 SINEY=(SIN(XPOINT/SINEPERIOD)*SINEAMPLITUDE)+(YRES/2)
UE 220 COSINEY=(COS(XPOINT/COSINEPERIOD)*COSINEAMPLITUDE)+(YRES/2)
LY 230 PLOT XPOINT,SINEY:DRAWTO XRES-XPOINT,COSINEY
MA 240 IF PEEK(764)<>255 THEN XPOINT=XRES

BD 250 NEXT XPOINT
LB 260 GET #1,KEYPRESS
QJ 270 IF CHR$(KEYPRESS)="X" THEN LOOP=2
NJ 280 NEXT LOOP

```

LISTING 2

```

/* Color Sinewave Program */
/* By Patrick Bass */
/* (C) 1985, ANTIC PUBLISHING */

#include "portab.h"
#include "obdefs.h"
#include "define.h"
#include "gemdefs.h"
#include "osbind.h"

int contrl[12], intin[256], ptsin[256], intout[256], ptsout[256];
int l_intin[20], l_ptsin[20], l_out[100];
int color, max_color, handle, xres, yres;
int i, k, iter, loop, times, dummy;
int sin_amplitude, cos_amplitude;
int sin_period, cos_period, step;
int key_state;

double number, xpoint;

extern double sin(), cos(), random();

main()
{
    appl_init();

    handle=graf_handle(&dummy,&dummy,&dummy,&dummy);

    for(i=0; i<10; i++)
    {
        l_intin[i]=1;
    }
    l_intin[10]=2;

    v_opnvwk(l_intin, &handle, l_out);
    xres=l_out[0];
    yres=l_out[1];
    max_color=l_out[13];

```



```

for( loop=0; loop < 1; loop=loop+0 )
{
    do
    {
        color= Random() & 15;
    }
    while( color < 0 || color > max_color );

    vs1_color( handle, color );

    step=( Random() & 3 )+1;

    do
    {
        sin_amplitude=( Random() & 255 )+10;
    }
    while( sin_amplitude < 30 || sin_amplitude > (yres/2) );

    do
    {
        cos_amplitude=( Random() & 255 )+10;
    }
    while( cos_amplitude < 30 || cos_amplitude > (yres/2) );

    do
    {
        sin_period=( Random() & 127 )+10;
    }
    while( sin_period < 10 || sin_period > 100 );

    do
    {
        cos_period=( Random() & 127 )+10;
    }
    while( cos_period < 10 || cos_period > 100 );

    for( iter=1; iter<xres; iter=iter+step)
    {
        xpoint=iter;

        ptsin[0]=xpoint;
        ptsin[1]=(sin(xpoint/sin_period)*sin_amplitude)+(yres/2);

        ptsin[2]=(xres-xpoint);
        ptsin[3]=(cos(xpoint/cos_period)*cos_amplitude)+(yres/2);

        v_pline( handle, 2, ptsin);

    }

    do
    {
        vq_key_s( handle, &key_state );
    }
    while( key_state == 0 );

    if ( key_state == 8 ) loop=2;
}

v_c15vbk(handle);
appl_exit();
}

```


ATARI BONANZA

POWER WITHOUT THE PRICE

Listed below are computers, peripherals, software, video games and special package offers at incredibly low, ATARI-factory prices. Now you, or someone you know,

can own a brand-new Atari system or add exciting software to an already existing library, at tremendous savings!

SPECIALS

LEARNING SYSTEM

800XL Computer with 64K, 1010 Program Cassette Recorder, Music Composer software, Speed Reading courseware and tapes, Touch Typing, States and Capitals, Invitations to Programming 1

\$149.99

reg. \$230
SAVE \$80

HOME MANAGER SYSTEM

130XE Computer with 128K RAM, 1050 Disk Drive with DOS 2.5 and Ramdisk utility, Home Manager Kit including Family Finances software and Home Filing Manager

\$349.99

reg. \$375
SAVE \$25

PERSONAL PRODUCTIVITY SYSTEM

800XL computer with 64K RAM, 1050 Disk Drive with DOS 2.5, AtariWriter professional word processing software, VisiCalc spreadsheet financial calculator, TimeWise personal scheduler

\$299.99

reg. \$385
SAVE \$85

TO ORDER:

Use handy order blank

or use blank paper and list products to be purchased, part #'s, and enclose payment.

BUT PLEASE ACT NOW. ORDERS ARE ON A FIRST COME BASIS. INVENTORIES FOR MANY OF THE SPECIALS ARE LIMITED!

POSTERS

Stargate	\$3.99
Getaway	3.99
Atari Age	3.99
Silicon Valley	3.99
Pole Position	3.99
Space Station	3.99
Final Legacy	3.99
Future Maker	3.99
Lucasfilm	3.99

FINANCIAL/EDUCATIONAL/ RECREATIONAL COMPUTER KITS

BASIC TUTOR ADD-A-PACK—KX7099

Invitation to Prog. I, II, Inside Atari Basic Book, 101 Programming Tips & Tricks with Cassette

\$19.99

HOME MGR. KIT—CX418

Family Finances Home Filing Mgr.

\$24.99

ARCADE CHAMP—KX7102

Pac Man & Qix in cartridge holder. 2 X-Y Joystick Controllers

\$19.99

EDUCATOR KIT—CX482

410 Recorder, Basic Cart, States & Capitals

\$19.99

2600 and 5200 PACKAGES

2600	Videogame Console	Save \$25
CX22	TrakBall	
CX26118	Millipede	
CX2676	Centipede	Pkg. 1 \$69.99

2600	Videogame	Save \$48
CX2675	Mx. Pac-Man	
CX2684	Galaxian	
CX2691	Joust	
CX2692	Moon Patrol	Pkg. 2 \$69.99

5200	Videogame Console	Save \$37
CX5203	Super Breakout	
CX5240	Joust	
CX5221	Berzerk	Pkg. 1 \$89.99

5200	Videogame Console	Save \$45
CX55	VCS Cartridge Adaptor—enables you to play all 2600 software	
CX5203	Super Breakout	
CX2675	Ms. Pac-Man	Pkg. 2 \$99.99

POWER WITHOUT THE PRICE

COMPUTER SOFTWARE FOR 800, 600 XL, 800 XL, 130 XE PERSONAL COMPUTERS

BUSINESS AND PRODUCTIVITY

Word Processor

RX8036 Atariwriter Cart \$39.99

Spreadsheet

DX5049 VisiCalc Disk 29.99

Database

CX415 Home File Manager Disk 24.99

ACW250 Codewriter Disk 49.99

CWH200 Filewriter Disk 29.99

CWR200 Reportwriter Disk 29.99

CWM200 Menuwriter Disk 29.99

Home Finances

CX421 Family Finance Disk \$29.99

CWHI200 Home Integrator Disk 29.99

CX418 Home Manager Kit Disk 59.99

Accounting

CWBI200 Small Business Inv. Disk \$14.99

CWSE200 Salesman's Expenses Disk 14.99

CWRP200 Accts. Recv/Payable Disk 14.99

CWRI200 Retail Invoice Disk 14.99

Calendar

DX5047 Timewise Disk \$14.99

UTILITIES AND LANGUAGES

KX7097 Logo Kit Cart \$49.99

CXL4018 Pilot Cart 39.99

AX2025 Microsoft II Cart/Disk 29.99

CXL4003 Assem/Editor Cart 24.99

CX8121 Macro Assembler Disk 24.99

CX8126 Microsoft Basic I Disk 59.99

RECREATION

Action Games

CXL4013 Asteroids Cart \$16.99

CXL4004 Basketball Cart 16.99

CXL4020 Centipede Cart 16.99

RX8030 E.T. Cart 16.99

CXL4024 Galaxian Cart 16.99

CXL4012 Missile Command Cart 16.99

CXL4027 Qix Cart 16.99

CXL4008 Space Invaders Cart 16.99

CXL4011 Star Raiders Cart 16.99

CXL4006 Super Breakout Cart 16.99

RX8021 Caverns of Mars Cart 19.99

CXL4025 Defender Cart 19.99

RX8044 Joust Cart 19.99

RX8049 Jungle Hunt Cart 19.99

RX8048 Millipede Cart 19.99

RX8052 Moon Patrol Cart 19.99

CXL4022 Pac Man Cart 19.99

RX8045 Pengo Cart 19.99

RX8033 Robotron Cart 19.99

RX8026 Dig Dug Cart 19.99

RX8043 Ms. Pac Man Cart 19.99

RX8034 Pole Position Cart 19.99

RX8067 Final Legacy Cart 19.99

KX7101 Entertainer Kit Cart 24.99

KX7102 Arcade Champ Kit Cart 24.99

Sports

RX8029 R.S. Football Cart \$16.99

RX8042 Tennis Cart 16.99

RX8069 Track and Field Cart 29.99

Strategy/Adventure

CXL4009 Chess Cart 16.99

RX8039 Eastern Front Cart 16.99

CWA200 Adventure Writer Disk 24.99

CWSV200 Star Voyager Disk 14.99

EDUCATION

Music

CXL4007 Music Composer Cart \$24.99

AX2020 Music I Disk 24.99

AX2026 Music II Disk 24.99

Computer Skills

CX483 Programmer Kit Cart \$39.99

CX4101 Invite to Prog. I Tape 7.50

CX4106 Invite to Prog. II Tape 7.50

CX4117 Invite to Prog. III Tape 7.50

KX7099 Basic Tutor Kit Tape 19.99

Physical Sciences

AED80013 AtariLab Starter Kit

Cart \$59.99

AED80014 AtariLab Light Mod. Cart 39.99

CX4123 Scram Tape 16.99

Language Arts

RX8059 Skywriter Cart \$17.99

CX4118 Convrstnl. German Tape 17.99

CX4119 Convrstnl. French Tape 17.99

CX4120 Convrstnl. Spanish Tape 17.99

CX4125 Convrstnl. Italian Tape 17.99

CX8135 My First Alphabet Disk 17.99

General

CX4100 Touch Type Tape \$16.99

CX4126 Speed Reader Tape 24.99

RX8057 Typo Attack Cart 17.99

Early Learning Skills

CX8137 Juggles Rainbow Disk 19.99

CX8138 Juggles House Disk 19.99

Creative

DX5048 Paint Cart \$24.99

MOBILES

Centipede \$4.99

Ms. Pac Man 4.99

E.T. 4.99

BAGS

Safari Duffel \$9.99

Totebags 9.99

Backpacks 9.99

T SHIRTS

Adult (various) \$6.99

Youth 6.99

TO ORDER:

Use handy order blank

or use blank paper and list products to be purchased, part #'s, and enclose payment.

BUT PLEASE ACT NOW. ORDERS ARE ON A FIRST COME BASIS. INVENTORIES FOR MANY OF THE SPECIALS ARE LIMITED!

POWER WITHOUT THE PRICE

ATARI COMPUTER CONTROLLERS

CX21	Touch Pad Controllers—Alpha Numeric	\$9.99
CX22	Trak Ball—Proline	14.99
CX30	Paddle Controller	9.99
CX40	Joysticks	6.99
CX40P	Joystick Pair (CX40's in one box)	17.99
CX41	Joystick Repair Kit	3.99
CX43	Space Age Joystick	9.99
CX75	Light Pen	39.99
CX77	Touch Tablet	44.99
CX80	Trak Ball—HCD	14.99
CX85	Numeric Keypad	24.99

COMPUTER CABLES AND ACCESSORIES

CX82	Black/White Monitor Cable	24.99
CX853	16K RAM Module for 800 Computer	19.99
CX86	Printer Cable	24.99
CX87	Modem Cable	24.99

ATARI COMPUTER AND PERIPHERALS

800 XL	64K Computer	99.99
130 XE	128K Computer	149.99
1050	5¼ Disk Drive	199.99
1027	Letter Quality Printer	199.99
1020	Printer Plotter—40 Column	49.99
1010	Cassette Record for 130 XE/800 XL	49.99
850 PCBA	Interface Module (PC Board)	49.99
830	Acoustic Modem + CXL4015	24.99
	Telelink Cartridge	
825	Printer	79.95
410	Cassette Recorder for 800 Computer	19.99

ATARI PROMOTIONAL ITEMS

Breakout Scarfs	\$6.99
Breakout Hats	4.99
Centipede Buttons	.99
Frisbees	6.99

ATARI COMPUTER SOFTWARE

CXL4015	Telelink	Cart	\$4.99
CX4104	Mailing List	Tape	4.99
DX5047	Timewise	Disk	4.99
CX4129	Juggles Rainbow Tape	Tape	4.99
CX4130	Juggles House Tape	Tape	4.99
CX4114	European Cities, Countries	Tape	4.99
CX4110	Touch Typing	Tape	6.99
CXI4007	Music Composer	Disk	6.99
CXL4013	Asteroids	Cart	6.99
CXL4004	Basketball	Cart	6.99
CXL4020	Centipede	Cart	6.99
CXL4009	Chess	Cart	6.99
CXL8030	E.T.	Cart	6.99
RX8030	Qix	Cart	6.99
CXL4008	Space Invaders	Cart	6.99
CXL4006	Super Breakout	Cart	6.99
AED80001	Spelling in Context/1	Disk	6.99
AED80002	Spelling in Context/2	Disk	6.99
AED80003	Spelling in Context/3	Disk	6.99
AED80004	Spelling in Context/4	Disk	6.99
AED80005	Spelling in Context/5	Disk	6.99
AED80006	Spelling in Context/6	Disk	6.99
AED80007	Spelling in Context/7	Disk	6.99
AED80008	Spelling in Context/8	Disk	6.99
AED80009	Math Facts and Games	Disk	6.99
AED80010	Concentration	Disk	6.99
AED80011	Division Drill	Disk	6.99
AED80016	US Geography PGK/CK Marc	Disk	6.99
AED80017	US Geography PK/High Marc	Disk	6.99
AED80020	Secret Formula-Elementary	Disk	6.99
AED80021	Secret Formula-Intermedia	Disk	6.99
AED80022	Secret Formula-Advanced	Disk	6.99
AED80033	Screen Maker	Disk	6.99
AED80034	Player Maker	Disk	6.99
AED80047	Instruct Computing Demo	Disk	6.99
AED80048	Music I/Term Notations	Disk	6.99
AED80049	Music II/Rhythm & Pitch	Disk	6.99
AED80050	Music III/Scales & Chords	Disk	6.99
AED80051	Elementary Biology	Disk	6.99
AED80052	Earth Sciences	Disk	6.99
AED80052	Geography	Disk	6.99
AED80054	Prefixes	Disk	6.99
AED80055	Metric & Problem Solving	Disk	6.99
AED80056	The Market Place	Disk	6.99
AED80057	Basic Arithmetic	Disk	6.99
AED80058	Graphing	Disk	6.99
AED80059	Pre-Reading	Disk	6.99
AED80060	Counting	Disk	6.99
AED80061	Software for Your Atari	Book	6.99
AED80062	Atari Games & Recreations	Book	6.99
AED80066	Expeditions	Disk	6.99
AED80067	Spelling Bee	Disk	6.99
AED80069	Word Games	Disk	6.99
APX 20235	Excalibur	Disk	6.99
APX 20236	Kangaroo	Disk	6.99
APX 20059	Data Manager	Disk	6.99
APX 20078	Astrology	Disk	6.99
APX 20100	Advanced Music	Disk	6.99
APX 20144	Map Maker	Disk	6.99
APX 20182	Magic Melody	Disk	6.99
APX 20192	AT Speller	Disk	9.99
APX 20223	Printer Drivers	Disk	9.99
APX 20132	Gallahad and the Holy Grail	Disk	9.99
APX 20262	ATspeller/Atariwriter	Disk	9.99
DX505	Mickey, Great Outdoors	Disk	9.99
CX8106	Bond Analysis	Disk	9.99
CX8107	Stock Analysis	Disk	9.99
CX8108	Stock Charting	Disk	9.99
CX8126	Microsoft Basic I	Cart	9.99

TO ORDER:

Use handy order blank

or use blank paper and list products to be purchased, part #'s, and enclose payment.

BUT PLEASE ACT NOW. ORDERS ARE ON A FIRST COME BASIS. INVENTORIES FOR MANY OF THE SPECIALS ARE LIMITED!

POWER WITHOUT THE PRICE

2600 VIDEOGAME PRODUCTS

CX2600	Video Computer System	49.99
CX21	Touch Pad Controller—Alpha Numeric	9.99
CX22	Trak Ball—Proline	14.99
CX30	Paddle Controller	9.99
CX40	Joysticks	6.99
CX40P	Joystick Pair (CX40's)	11.99
CX41	Joystick Repair Kit	3.99
CX42	Remote Control Joysticks (2 per pkg.)	14.99
CX43	Space Age Joystick	9.99

SOFTWARE

CX2681	Battlezone	14.99
CX2676	Centipede	14.99
CX2684	Galaxian	14.99
CX26127	Gremlins	14.99
CX2691	Joust	14.99
CX2688	Jungle Hunt	14.99
CX2689	Kangaroo	14.99
CX2692	Moon Patrol	14.99
CX2699	Taz	14.99
CX26110	Crystal Castles	\$22.99
CX26120	Stargate	22.99
CX2677	Dig Dug	22.99
CX2675	Ms. Pac-Man	22.99
CX2694	Pole Position	22.99
CX26125	Track & Field	\$26.99

KIDS

CX26103	Alpha Beam	\$16.99
CX26104	Big Bird's Egg Catch	16.99
CX26101	Oscar's Trash Race	16.99
CX26114	Pigs in Space	16.99
CX26111	Snoopy and the Red Baron	16.99

5200 SUPERSYSTEM PRODUCTS

CX5200	Supersystem	\$79.99
CX50	Keyboard Controller—Alpha Numeric Keypad	9.99
CX530	TrakBall Controller	19.99
CX55	VCS Cartridge Adaptor	24.99

SOFTWARE

CX5210	Countermeasure	\$16.99
CX5206	Galaxian	16.99
CX5205	Missile Command	16.99
CX5236	Pengo	16.99
CX5212	Qix	16.99
CX5209	R.S. Baseball	16.99
CX5207	R.S. Football	16.99
CX5213	R.S. Soccer	16.99
CX5214	R.S. Tennis	16.99
CX5232	Space Dungeon	16.99
CX5204	Space Invaders	16.99
CX5205	Star Raiders	16.99
CX5203	Super Breakout	16.99
CX5221	Berzerk	\$19.99
CX5215	Centipede	19.99
CX5253	Choplifter	19.99
CX5218	Defender	19.99
CX5240	Joust	19.99
CX5222	Jungle Hunt	19.99
CX5241	Kangaroo	19.99
CX5208	Pac-Man	19.99
CX5225	Robotron	19.99
CX5211	Dig Dug	\$22.99
CX5243	Ms. Pac-Man	22.99
CX5217	Pole Position	22.99
CX5216	Vanquard	22.99

ATARI ORDER FORM

NAME _____ PHONE _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP _____

Mail order form and payment to:

Atari Bonanza
P.O. Box 3427
Sunnyvale CA 94088

Please allow up to six weeks for delivery.

[illegible]

Use blank paper for additional items.

- ☐ Check or money order enclosed.
☐ VISA or ☐ MasterCard

Exp. _____ / _____

Signature _____

**SUB
TOTAL**

**CALIF. RESIDENTS
ADD 6.5%
SALES TAX**

TOTAL \$

No COD's, please
There is no charge for shipping

FINE SCROLLING WORLD: PART II

*Dot-by-dot screen moves,
8 times smoother!*

by MARK ANDREWS

The conclusion of a two-part tutorial on assembly language scrolling, by the author of Atari Roots. You'll learn how to program screens that scroll with professional smoothness, by controlling the Atari's scrolling registers and vertical blank interrupt vectors. The demonstration program is written in assembly language and requires either the MAC/65 assembler (O.S.S.) or the Atari Assembler Editor. It will run on all Atari 8-bit computers, with disk or cassette. This series is intended for programmers with at least an introductory knowledge of assembly language.

The reason fine scrolling works so smoothly is that it has eight times the resolution of coarse scrolling. When coarse scrolling is used in a program, it causes lines of text to jump across the screen (or up and down) one full character at a time. But when fine scrolling is used, text can be moved around the screen one eighth of a character at a time. Here's how that works.

Look closely at a text character on your video screen, and you'll see that it's made up of a matrix of tiny dots. If you had a magnifying glass, you'd be able to see that there are 64 dots in each character—eight rows of dots (or scan lines) high, and eight rows of dots (or color clocks) across. And

these rows of dots—scan lines and color clocks—are the increments used in fine scrolling.

To create and implement a fine scrolling routine, several steps are required. First, you must go to your display list and enable fine scrolling by setting certain bits in the LMS instruction that appears before every line you want to scroll. When bit 4 of an LMS instruction is set, the line that follows the LMS instruction can be scrolled horizontally. When bit 5 of an LMS instruction is set, the line that follows the LMS instruction can be scrolled vertically. If both bit 4 and bit 5 of an LMS instruction are set, the line that follows the instruction can be scrolled both horizontally and vertically.

TYPING IT IN

Type in Listing 1. If you've got the listing from last month's scrolling demo, you can edit and expand it to create this month's listing. Those with MAC/65 can use the listing as is. Atari Assembler Editor owners should substitute the alternate lines in Listing 2.

Antic Disk subscribers will find the MAC/65 source code under the filename FINESCRL.M65, and the object code as FINESCRL.EXE. If you have the Atari Assembler Editor, you must type in the alternate lines from Listing 2. To run the object code from DOS

2, type [L] [RETURN] FINESCRL.EXE [RETURN].

ENABLING

Take a look at lines 340 through 390 in the program you just typed, and you'll see that the LMS instruction preceding the line which I've labeled SCROLN (the line that scrolls) is \$57. Most LMS instructions, as we have seen, begin with the digit 4. Why, then, does this one begin with the digit 5?

The number \$47, expressed in binary notation, is 0100 0111. Bit 4 of that binary number is a zero and, therefore, not set. This means horizontal fine scrolling is not enabled. If you set bit 4, the number becomes 0101 0111 (or \$57) and horizontal fine scrolling is enabled. And that's why the last byte in line 380 of Listing 1 is \$57.

Now suppose you wanted to scroll SCROLN vertically instead of horizontally. What would you do? Well, you'd simply set bit 5 of the LMS instruction in line 380. Then the \$57 that ends that line would become \$67—or in binary notation, 0110 0111. If you wanted to enable both horizontal and vertical scrolling of the line, you'd simply change the last value in line 380 to \$77 (0111 0111).

Fine scrolling, like coarse scrolling, can be performed on any number of lines of text on your screen. Just set

the appropriate bits in the proper LMS instructions, and the desired type of scrolling can be implemented for each selected line.

But what if a display list contains no LMS instruction for a line you want to scroll? Well, in that case, you could simply write one. There's no reason a display list can't have an LMS instruction for every line on the screen. In fact, when an entire screen is to be scrolled, a separate LMS instruction must be used for each line that appears on the screen.

IMPLEMENTATION

So far, all we've talked about is how to enable fine scrolling. But once fine scrolling has been enabled, how is it implemented?

When fine scrolling of a line is enabled, control of the line is handed over to one of two *scrolling registers* that reside in your Atari's operating system. If you have authorized a horizontal scroll on a given line of a display, then that line becomes subject to the control of a *horizontal scroll register*, which is abbreviated HSCROL and is at memory address \$D404.

When a vertical scroll has been enabled for a given display-list line, that line becomes subject to the control of a *vertical scroll register*, or VSCROL, at address \$D405. If both horizontal and vertical scrolling of a given line are enabled, then that line becomes subject to the control of both the HSCROL and the VSCROL registers.

After control of a line has been turned over to HSCROL, VSCROL, or both, you can implement fine scrolls by loading a value into the appropriate scrolling registers. When you load a number into the HSCROL register, every display list line that has been put under the control of that register will be shifted to the right by the number of color clocks loaded into HSCROL.

Load a number into the VSCROL register, and every line for which a vertical scroll has been enabled will be scrolled upward by the number of scan lines you have specified.

If both horizontal and vertical scrolling of a given line are enabled, you can move that line left, right, up or down by loading appropriate values into both HSCROL and VSCROL.

COMBINATIONS

There is one hitch, though. The scrolling registers are eight bits, and only four of the eight bits in each register are used. That means that fine scrolling can be taken only so far. To work properly, fine scrolling must be combined with coarse scrolling.

The best way to combine fine and coarse scrolling is to fine scroll a line or column of characters by seven color clocks or scan lines, and then reset the appropriate fine scrolling register to its initial value and implement one coarse scroll. Loop through this kind of procedure over and over, and the result will be a smooth fine scroll. You can see how this procedure works by studying and experimenting with Listing 1.

PERFECT SCROLLING

That's all there is to fine scrolling — if you don't mind putting up with a jerk, a jump or a smear every now and then on your screen. But if these kinds of messy situations don't appeal to you . . . Well, we've come this far — we might as well go on and talk about how to make fine scrolling perfect.

As you may know, your computer's screen display is redrawn by an electron gun 60 times every second. Between each of these screen refresh cycles, there's a split-second total screen blackout that takes place too rapidly for you to see.

So when you write a fine scrolling routine without taking special precautions, some of the scrolling action that you've programmed may take place while your display is actually being drawn on your screen. And this will usually result in unsightly jerks and smears.

Fortunately there is a way to keep this from happening. The folks who designed your Atari have provided something called a vertical blank interrupt (VBI) vector. Learn how to use that vector, and you can perform all kinds of graphics tricks in real time without messing up your display.

A vector is a pointer in your computer's operating system that contains the address of a specific routine. The main purpose of a vector is to offer an easy method for implementing often-used routines. When you jump to an OS vector during the course of a program, your program will automatically jump to the OS routine that the vector points to, and you can thus implement that routine without having to rewrite all of the code that it contains.

Vectors can sometimes be used in another way. Sometimes you can "steal" a vector. That is, you can change its value so that it points to a routine you've written yourself, rather than the OS routine it originally pointed to.

This allows you to use a vector as an easy method for controlling the behavior of your computer's operating system. Listing 1 contains one shamelessly stolen vector—a vertical blank interrupt vector called VVBLKI which is accessed via a pointer at address \$0222. (NOTE: There are actually two vertical blank vectors—immediate and deferred. For the purposes of this article we will only deal with the immediate vertical blank vector.)

continued next page

VBI VECTORS

Here's how the VVBLKI vector works. Every time your Atari starts a vertical blank interrupt, it takes a look at the contents of the VVBLKI pointer. If the program being processed does not make use of the VVBLKI pointer, that pointer will contain nothing but an instruction to jump to a predetermined memory address: specifically, memory location \$E45F (SYSVBV). And memory location \$E45F usually contains nothing but an instruction for your computer to continue its normal processing.

By stealing the VVBLKI vector, however, you can make it point to any routine you like—usually one you yourself have written. Then, 60 times every second, your computer will automatically process the routine whose address you have stored in the VVBLKI pointer. When your routine is finished, your computer will resume its normal processing.

Once you understand how the VVBLKI interrupt works, it isn't difficult to steal them. Here's all you have to do:

1. Write a short routine you would like to carry out during a vertical blank interrupt.
2. Make sure that your routine ends with a jump to SYSVBV.
3. Store the address of your routine at VVBLKI.

After these steps are taken, your computer will process your new routine 60 times every second—just before it begins each VBI interrupt.

ONE MORE THING . . .

There's just one more important fact that you should *remember* about VBI vector-stealing. After you've stolen a vector, there's a small chance that an

interrupt will begin after the first byte of the pointer that you're using has been updated, but before the second byte has been changed. If that happens, it could crash your program. But this possibility can be avoided by using a routine called SETVBV which begins at memory address \$E45C.

To use the SETVBV routine, first load the 6502 Y register with the low byte of the address of the routine that instructs your computer to begin a vector-changing routine. Then load the X register with the high byte of the address. Next, load the accumulator with a 6—a number which Atari computers recognize as a code for VVBLKI routines. Then do a JSR SETVBV, and your interrupt will be safely enabled.

In Listing 1, the VVBLKI vector is stolen in lines 830 through 860. The thievery committed in those lines is quite straightforward. The address of the SCROLL routine at line 910 is slipped into the VVBLKI vector, and from then on, the Atari that is running Listing 1 will automatically call the SCROLL routine 60 times per second, thinking the routine is part of its own operating system.

Mark Andrews wrote Atari Roots, probably the finest introduction to Atari assembly language. It has sold out, but hopefully will be back in print fairly soon. Antic published excerpts from this book in November and December 1984.

Listing on page 64



ADVERTISERS

We encourage you to patronize our advertisers — all of whom support the Atari computers. We will appreciate your mentioning ANTIC when you contact these firms.

ABACUS SOFTWARE	25
ABBY'S HOUSE OF DISCOUNT SOFTWARE . . .	37
AMERICAN TV	57
ANTIC	see insert
ATARI CORP. 68, 69, 70, 71, BC	
B & C COMPUTERVERSIONS .	80
BATTERIES INCLUDED	3
CSI	80
CAPESTYLE SOFTWARE . .	80
COMPUCAT	80
COMPUCLUB	81
COMPUTER CREATIONS . .	78
COMPUTER MAIL ORDER .	54
COMPUTER PALACE	39
COMPUTER SOFTWARE SERVICE	61
DATAMOST	42-43
E & B COMPUTER SPECIALTIES	80
END USERS GROUP	12
G.T. ENTERPRISES	77
GAMES COMPUTERS PLAY .	4
GIZZMOZ, INC.	75
HAPPY COMPUTING	41
ICECO	80
KYAN SOFTWARE	75
LOTSA BYTES	9
LYCO COMPUTING	2
MICROPROSE	29
NEW HORIZONS	75
OPTIMIZED SYSTEMS . . .	83
S.S.I.	11
SENECOM	75
SIX FORKS SOFTWARE . .	80
SOFT-RAK	81
SOFTWARE DISCOUNTERS .	50
SOUTHERN SOFTWARE . .	57
SUBLOGIC	33
VIP TECHNOLOGIES	19
WHITEHOUSE COMPUTER .	79

This is provided as a convenience and as a courtesy to advertisers. ANTIC does not guarantee accuracy or comprehensiveness.

kyan

PASCAL

For the Atari

kyan pascal is the most complete package available for learning and using the Pascal language. And now, it's available for the Atari family of computers.

kyan pascal is easy to use, lightning fast, and loaded with features. It's a full Pascal implementation and perfect for both beginning and advanced programmers.

kyan pascal features:

- Optimized Machine Code Compiler;
- Built-In Full Screen Text Editor;
- String-Handling, Chaining, Include File, and Other Powerful Extensions;
- 13-Digit Arithmetic Precision and Full Graphics Support;
- Built-In Assembler (Allows Full Hardware Control); and
- Tutorial Manual with Sample Programs

kyan pascal requires 48K of memory and a single disk drive. No additional hardware is necessary. And, it comes with **kyan's MONEY BACK GUARANTEE**. If not completely satisfied, return it within 15 days for a full refund.

kyan pascal for the Atari \$69.95

(Add \$4.50/copy for handling, \$12.00 outside North America. California residents add \$4.50/copy for sales tax.)

Send Check/Money Order to:

Call: (415) 775-2923

MC/Visa Accepted

kyan software, Dept. N

1850 Union St. Ste. 183

San Francisco, CA 94123

FROM

SENECOM



**THREE
PDQ DISKS
AND A NEW
FUTURE
\$9.95**

There is untapped potential in your Atari. And, perhaps, in you...

We'd like to share an opportunity too unique and worthwhile to describe in an ad. We're offering this remarkable bargain so you can see it for yourself without risk.

Order three PDQ (Premium Disk Quality) Disks (DSDD, 21-year Warranty) for only \$9.95. The front of each disk is ready for you to format and use. Boot in the program on the back (min. system: 48-K), and you may be surprised at what your Atari tells you.

Order PDQ! Write "PDQ" on a paper, with your (legible!) name and address; send with \$9.95 (We'll pay the shipping for USA and Canada. NYS residents add 7% Sales Tax) to:

SENECOM

Dept. 32

13 White St.

Seneca Falls, N.Y. 13148

Limit: one order per address, please.

Atari® is a registered trademark of Atari Corporation.

Senecom® is a registered trademark of Seneca Computer Company, Inc.

Genie

It's Magic!

Now, while working with just about any program, you can press a key and

Instantly

Edit and print a file
Do a quick calculation on a decimal/hex calculator
Look up any Atari Keyboard code
Access Atari DOS functions
(see a directory, view file contents, lock, unlock, rename, and delete files, and format disks)
And when you are done, you can return to EXACTLY WHERE YOU LEFT OFF!
Genie appears *only* when you summon it. It is completely invisible to almost all programs. It doesn't even use up any memory space!

See what you can do with a Genie in *your* computer.

Available for Atari XL or XE computers with at least 64K of memory. Genie is only \$29.95 plus \$2.00 for postage and handling (Texas residents please include 5 1/8% sales tax).

New Horizons Software
PO Box 180253 • Austin, TX 78718

New Horizons

EXPANDING YOUR LIFE

For more information, call (512) 280-0319

Dealer Inquiries Welcome
Atari is a registered trademark of Atari, Inc.

GIZZMOZ

800-225-5800 Call for our Catalog!
For ordering only 617-371-1855

Atari "ST" Products

Gem Write Professional ST Cobol 10 Meg
Gem Paint Valocs II DB Master Hard Drive

Lots of Other Exciting New Products!

Call for Pricing

Fischer-Technic Robot Kit \$99.95
with Interface \$159.95
Movit Robot Kits \$18.95 & up
US Doubler dbl. density for 1050 disk drive w/Sparta Dos \$52.46
Basic XE \$54.95
Atari Video Digitizer Kit Call
Relax from Synapse \$69.95

Atari and Atari ST Are Trademarks of Atari Corp.
Order: M/C, Visa, Personal checks allow 2 wks. MA residents add 5% s/s. tax. **Ship:** Orders under \$100 add \$3, over \$100 free ship. \$5 ship all ord. outside cont.
U.S. Warranty No returns w/o authorization.
Defective sftwr replaced w/same prgrm.

Inquiries 617-371-1855 P.O. Box 1402, Concord, MA 01742

product reviews

MYCHESS II

Datamost
20660 Nordhoff Street
Chatsworth, CA 91311
(818) 709-1202
\$29.95, 48K disk

Reviewed by Scott Lewis

Mychess II, originally developed for computers running the CP/M operating system, is the latest chess program to be converted for the Atari. Mychess II plays a good to very good game, and at \$29.95 is quite a bargain. The lowest three skill levels will not prove too difficult for anyone who has played much in amateur tournaments. But at the six higher levels it becomes quite a challenge.

Mychess II has several features not commonly found on chess programs. For example, the back side of the disk contains 128 all-time classic games including Napoleon v. Bertrand, 1820 and Alekhine v. Forrester, 1923.

All the usual features are provided, including game storage, retrieval and replay, hints, notation and diagram displays and instant printout. A clear



and precise Help screen is always available.

The game screen can be toggled between a standard view-from-above and a unique 3-D display. Unfortunately, the 3-D representation is cluttered and unclear. In fact, the graphics throughout this program are not especially good. The kings and queens are hard to tell apart and the

color contrast between the two opposing sides is equally confusing.

Other minor problems were that the instruction book cracked and lost 10 pages when I first opened it, and the disk label has already detached itself. But overall, Mychess II is quite a good chess program and well worth the price.

CRUSADE IN EUROPE

by Sid Meier and Ed Bever, Ph.D.
MicroProse Software
120 Lakefront Drive
Hunt Valley, MD 21030
\$39.95, 48K disk

Reviewed by Rich Moore

Crusade in Europe is a superb theater-level simulation of the campaign to liberate France during World War II. Authors Sid Meier and Ed Bever of MicroProse have done an excellent job keeping the player's wargaming role consistent with the functions of an actual campaign commander.

The game opens up with a "Patton"-like graphic/sound introduction that can be cut short by pressing [START]. Either a joystick or the keyboard can be used to select options, obtain information and give orders.

The five main scenarios have a total of 14 variants:

Battle for Normandy	(5 variants)
Race for the Rhine	(2 variants)
Operation Market-Garden	(2 variants)
Battle of the Bulge	(4 variants)
Battle for France	(1 variant)

You can play against a human opponent or the computer, choose the level of intelligence data about enemy forces, set handicaps and game speed, save the game in standard DOS files and even change parameters during the game.

The detailed hi-res map scrolls horizontally and vertically through three screens showing England, France, Belgium, Holland and Germany. The map is light during daylight hours and dark at night.

Both commanders have a variety of infantry, armor and headquarters units as well as supply depots. Additionally, the Allied commander has four air wings, and in some scenarios, paratroops.

The German commander has powerful SS Panzer tank divisions backing up his main forces. The starting force lay-down is historical, and reinforcements and replacements follow their historical schedules.

Play is *continuous*. If you don't act, the computer will! Also, any uncompleted orders in effect by either player will continue until the objective is obtained. Action may be frozen at any time—an often-used function when a week's activity can be simulated in an hour!

Forces may be given any of four action commands: Move, Attack, Defend or Reserve. Each of these commands may be given an objective. The unit will move to the designated point on the map, send its commander an "arrival message" and then attack, dig in, or wait for orders.

The units all have some "artificial intelligence" to simulate reasonable action on the part of subordinate commanders. Forces will advance to press successful attacks, or dig in and defend against superior forces. They will also beat strategic retreats to fight another day—if they can reach a safe area before getting wiped out.

The manual would be somewhat intimidating to a beginning wargamer, but it is very thorough and includes a great deal of historical background (read "hints") for all of the scenarios.

I'd recommend getting used to the game by playing the "Liberation of Paris" variant of the Normandy

product reviews

scenario. This gives you plenty of time and some good historical "benchmarks" to gauge your progress. To get the most practice, set up the game for two human players so you can control all the action!

Crusade in Europe belongs in every wargamer's collection. Adventurers who like graphic role-playing games such as Ultima III would probably enjoy this too. If the other MicroProse "Command Series" wargames are this good, the company has a real string of winners. Now if they'd move the battle to sea . . . *

*(*If the sea battle request in the last line of this review puzzles you, we'll explain about our new reviewer Rich Moore, an Atari programmer since 1980. In his professional life, he is Lieutenant Commander Richard Moore, Computer Simulation Model Manager for the Wargaming Department of the U.S. Naval War College. He also has over 1900 hours flying F-4 and F-14 jet fighters, plus a masters degree in operations research. Antic welcomes Commander Moore aboard. —ANTIC ED)*

MORE BASIC BETTING

by James Jasper
St. Martin's Press
175 Fifth Avenue
New York, NY 10010
227 pages, paperbound
\$12.95

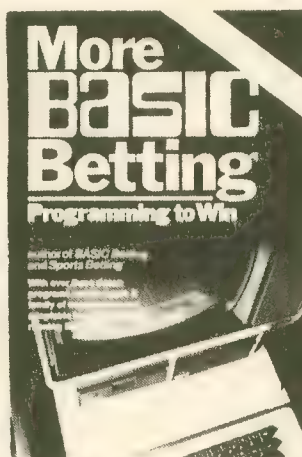
Reviewed by Nat Friedland

Chicago market research programmer James Jasper is a lifelong sports bettor who's written three popular books of type-in handicapping software. His first book came out before the microcomputer was widely available, and the author was forced to rely on calculator formulas.

Now Jasper's latest, **More BASIC Betting**, includes "programming to

win" for professional football, baseball and basketball, plus horseracing. There's also a sensible money management program for bettors.

All the programs are written in Apple II BASIC. The book also provides a mail-order source of program disks at the hefty price of \$119.95—and you'll still have to enter all the statistical data.



However, Antic's technical staff does agree with the author's claim that any Atari owner with a moderate knowledge of BASIC should easily be able to adapt these programs.

Between the programs are narrative chapters where the author raffishly, entertainingly and rather convincingly tells you about his wins or losses while betting with the programs.

When Jasper details his bets for the first two weeks of the 1984 baseball season, he claims a 13% profit. He says that his latest NFL football "sociogram" program has a 63% overall winning record.

He claims his basketball program never dropped below 59% accuracy and has gone as high as 66% per NBA season. He says that his horse racing program has consistently delivered 12% profits.

So is all this true? Obviously anybody who buys a betting program book is mainly concerned with win-

ning money consistently.

The problem with reviewing this kind of a book is that you really cannot verify the accuracy of the claims without typing in a great deal of sports statistical data and testing out the program for months.

Since we don't have the manpower to go through all of that, this magazine makes no guarantee how successful the programs will be for you.

All we can say is that James Jasper writes about sports betting quite believably and his program algorithms seem to make good sense.

For example, his horse racing and dog racing programs convert standard racing form information into an overall formula of "predicted beaten lengths" which is then automatically translated into betting odds.

If you do use this book to get computer help during the coming football season, please send Antic a letter or email telling us how you made out.



G T ENTERPRISES COMPUTER DISKETTES

5 1/4"
DS/DD
\$.99 each

5 1/4"
SS/DD
\$.90 each

LIFETIME GUARANTEE

Individually Tested, 100% Error Free
Reinforced Hub Rings, Write Protect Tabs,
Color ID Labels and Tyvec Envelopes Included
Add \$3.00 shipping per 100 or fewer diskettes
WA Residents add 8% sales tax

PHONE ORDERS C.O.D. Mastercard & Visa Accepted
MAIL ORDERS Certified Checks & Money Orders receive immediate processing Personal checks allow 3 wks to clear

G T ENTERPRISES
2400-SW 325th Street, Federal Way, WA 98023
To Order, Phone Our 24 Hour Toll Free Line
1 (800) 828-2828, Ask For Ext. 525
Specific Questions and Inquiries
(206) 838-5107

Computer Stores ask about our wholesale and private labeling service



POWER WITHOUT THE PRICE AT...COMPUTER CREATIONS



ATARI HARDWARE PACKAGES

Atari 520 ST Computer **Pkg. #1**
Atari SM 124 Monochrome Monitor
Atari SF 354 (3 1/2") Floppy Disk Drive

Atari 520 ST Computer **Pkg. #2**
Atari SC 1224 (12" RGB) Color Monitor
Atari SF 354 (3 1/2") Floppy Disk Drive

Atari 800 X/L Computer **Pkg. #3**
Atari 1050 Disk Drive

Call For Our Low Prices

DISK DRIVES

Atari 1050
Indus GT (Free Software) **CALL FOR NEW PRICES**
Atari SF 354 (3 1/2" floppy disk 500K)
Atari SH 317 (3 1/2" hard disk 10 MB)
Happy Enhancement for Atari 810 and 1050 Drives

PRINTERS

Atari XTM 201
Atari XTC 201 **CALL FOR NEW PRICES**
Atari XDM 121
Atari XMM 801
Atari ST 504

EPSON PRINTERS

LX-80 (80 column)
LX-80 Tractor Feed
Epson FX-80+ (80 col.)

STAR MICRONICS PRINTERS

SG-10 (80 column)
SG-15 (136 column) **CALL FOR PRICES**
SD-10 (80 column)
SR-10 (80 column)

Powertype Daisywheel
Powertype Tractor Feed

PANASONIC PRINTERS

KX - 1090 **CALL FOR PRICES**
KX - 1091
KX-1092
Okimate 10 plus plug n' print

PRINTER INTERFACE CABLES

MPP-Microprint 39
MPP-1150 Parallel Printer Interface 59
U-Print A 69
A-16 Interface/Buffer 99
APE Face XLP 59
APE Face 12XLP 59
Microbits Microstuffer 109
MPP-1151 62

PRINTER RIBBONS

Gemini Printers (Black) 3
Gemini Printers (Blue/Red/Purple/Brn./Grn.) 4
Epson Printers (80) Series 6

FLOPPY DISKS AS LOW AS 59¢ EACH DISKETTES (2 box minimum) 10 per box

	Generic (SKC)		Wabash		Maxell		Generic (Bulk)		BASF (Ea.) 3 1/2"	
# Boxes	SS/DD	DS/DD	SS/DD	DS/DD	SS/SD	DS/DD	SS/DD	DS/DD	SS/DD	DS/DD
2	9.99	11.99	13.99	19.99	18.99	27.00	7.99	9.99	3.49	4.99
3 - 6	8.99	10.99	12.99	19.49	17.99	26.00	6.99	8.99	3.19	4.49
7 - 10	7.99	9.99	11.99	18.99	16.99	25.00	5.99	7.99	2.99	3.99

Panasonic Printers, Black 8
Panasonic Printers, Color 11

MONITORS

Atari XC 141 (14" Composite Color)
Atari XM 148 (12" Monochrome 80 column, low resolution) **CALL FOR PRICES**
Atari SM 124 (12" Monochrome 80 column, high resolution)
Atari SC 1224 (12" RGB Color)

Sanyo 12" Green Screen 79
Sanyo 12" Amber Screen 79
Monitor Cable 5
Teknika 13" Color MJ 10 189

MODEMS

Atari 1030 Direct 300 BAUD 69
Atari XM 301 Direct
Connect 300 BAUD **CALL**
MPP-1000E Modem 79
Signalman XII Modem 199
R-Verter 39
Compuserve Starter Kit 21
850 Interface 114
Anadex (Hayes Compatible) 239

UPGRADES/ACCESSORIES

Flip n' File 10 4
Flip n' File 15 7
Original Flip n' File 50 14
Flip n' File Cart Case 12
Library Cases 10 colors 4
Disk Bank 5 (Holds 50) 12
Disk Bank (Holds 10) 5
Power Strip (6 outlet) 16
Lineguard Spike Suppressor 13
Disk Drive Cleaning Kit 6
MicroMate Paper (20# 540 sheets) 10
Printer Stand (wire) 16
Dust Covers **Call for availability**
Disk Coupler (notch) 3

UPGRADES:

Ram Rod X/L W/Omnium 99
Omniview for 800 XL 49
U.S. Doubler 59
MPP 64 K 69
R-Time 8 Cartridge 59

COMPLETE LINE OF ATARI SOFTWARE CALL IF YOUR PROGRAM IS NOT LISTED!!

SOFTWARE

NEW ATARI PROGRAMS

Codewriter 39
Filewriter 21
Reportwriter 21
Menuwriter 21
Home Integrator 20
Small Business Inventory 12
Salesman's Expenses 12
Accounts Rec./Pay. 12
Retail Invoice 12
Final Legacy 15
Adventure Writer 18
Star Voyager 12

EPYX

Dragonriders of Pern (D) 21
Summer Games 28
Pitstop II (D) 28
Ballblazer (D) 28
Rescue on Fractalus (D) 28
Temple of Apsai (D) 21

ACCESS

Beach Head (D) 24

ACTIVISION

Decathalon (R) 18
Pitfall II (R) 18
Space Shuttle (R) 18
Ghost Busters (D) 22

BATTERIES INCLUDED

Paperclip (D) 41
Homopak 35
B/Graph 48

BRODERBUND

Printshop (D) 31
Spelunker (D) 21
Stealth (D) 21
Whistler's Brother (D) 21

DATASOFT

Bruce Lee 28
Dallas Quest 24
Conan 28
Letter Wizard 52

ELECTRONIC ARTS

Archon (D) 18
Pinball Construction (D) 18
M.U.L.E. (D) 18
Murder/Zinderneuf (D) 18
One on One (D) 25
Archon II (D) 25
Music Construction (D) 18
Realm/Impossibility (D) 18
Hard Hat Mack 14
Seven Cities of Gold 25
Cut and Paste 18

INFOCOM

Cut Throats (D) 24
Deadline (D) 31
Enchanter (D) 24
Hitchhiker's Guide to the Galaxy (D) 24
Infidel (D) 28
Planetfall (D) 24
Sea Stalker (D) 24
Sorcerer (D) 28
Starcross (D) 31
Suspect (D) 28
Suspended (D) 31
Witness (D) 24
Zork I (D) 24
Zork II or III (D) 28
Invisicubes Hint Books 7

MICROPROSE

F-15 Strike Eagle (D) 24
Mig Alley Ace (D) 24
Solo Flight (D) 24
Kennedy Approach 24

OSS

Action (R) 50
Action Tool Kit (D) 19
Basic XL (R) 38
DOS XL (D) 19
Basic XE 50
Mac 65 (R) 50
Mac/65 Tool Kit (D) 19
Writer's Tool Kit 45
Basic XL Tool Kit 19

ORIGIN

Ultima III (D) 42

SCARBOROUGH

MasterType 28
Net Worth 55

SIERRA ON LINE

Ultima I 24
Ultima II 41

SYNAPSE

Quasimodo 17
Alley Cat 14
Syn-File + 35
Syn-Calc 35
Syn-Trend 28
Syn-Comm 28
Syn-Stock 28
Mindwheel (needs 2 drives) **Call**

TRONIX

S.A.M. 42

To order call TOLL FREE
1-800-824-7506

ORDER LINE ONLY

COMPUTER CREATIONS, Inc.

P.O. BOX 493 - DAYTON, OHIO 45459

For information, order inquiries, or for Ohio orders (513) 435-6868

Order Lines Open 9:00 a.m. to 9:00 p.m. Mon.-Fri.; 10 a.m. to 4:00 p.m. Sat. (Eastern Standard Time). Minimum \$15 per order. C.O.D. (add \$3.00). Please specify computer system. Call toll free number to verify prices and availability of product. Prices and availability are subject to change without notice. We ship C.O.D. to Continental U.S. addresses only! Hardware requires additional freight charges (min. \$4.00). Software and accessories add \$3.00 shipping and handling in Continental U.S. Actual freight will be charged outside U.S. to include Canada, Alaska, Hawaii, Puerto Rico and APO. Ohio residents add 6% sales tax. Canadian orders add 5% shipping, (min. \$5.00). All other foreign orders, please add 15% shipping, (min. \$10). For immediate delivery send cashier's check, money order or direct bank transfers. Personal and company checks allow 3 weeks to clear. School purchase orders welcome. Due to our low prices, all sales are final. NO CREDITS. All defective returns must have a return authorization number. Please call (513) 435-6868 to obtain an RA# or your return will not be accepted for replacement or repair.

No extra charge
for MasterCard
or Visa

ELECTRONIC ONE*

ATARI COMPUTER HARDWARE
 ATARI 800XL 88.00
 ATARI 1200XL 58.00
 ATARI 520ST 3 1/2" Disk
 DRIVE, R.G.B. COLOR
 DISK DRIVES 818.00

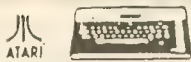
ATARI 1050 148.00
 INDUS G.T. 208.00
 CENTURIAN 810 158.00

PRINTERS
 STAR SG10 238.00
 PANASONIC 1091 238.00
 EPSON LX80 238.00
 ATARI 1027 178.00
 ATARI 1025 148.00
 ATARI 1020 38.00
 APE FACE INTERFACE 49.99
 UPRINT 54.99
 UPRINT 16K BUFFER 79.99

ATARI COMPUTER HARDWARE
 TOUCH TABLET 42.99
 1030 MODEM 69.99
 MPP1000E MODEM 69.99
 ATARI LAB STARTER KIT 44.99
 TENICKA 13" COLOR
 MONITOR 198.00
 AMDEC 300 COLOR 228.00
 SAKATA 13" COLOR 168.00
 ATARI KEY PAD 24.99
 COMPUSERVE STARTER KIT 18.99

SPECIAL
ATARI 130XE
COMPUTER
129.77

HOW TO ORDER: CASHIER CHECK, MONEY ORDER, MASTERCARD*
 or VISA* (Add 4% for charge cards) . . . NO PERSONAL CHECKS . . . NO
 C.O.D.'s . . . SHIPPED U.P.S. **PRICES SUBJECT TO CHANGE.**
SHIPPING: Prompt one day shipping on in-stock merchandise. Ohio resi-
 dents add 5.5% sales tax. Add \$3.00 on all orders under \$100.00 . . . Add
 \$5.00 on all orders over \$100.00.
INTERNATIONAL: Actual freight charge on all orders outside the continen-
 tal United States including A.P.O.
 CALL OR WRITE FOR FREE CATALOG



ELECTRONIC

ONE

CALL (614)864-9994
 P.O. Box 13428 • Columbus, Oh 43213

ATARI COMPUTER SOFTWARE
 ATARI WRITER 29.99
 PAPER CLIP 36.99
 ACTION 59.99
 BASIC XL 54.99
 BASIC XE 54.99
 LOGO 32.99
 MICRO SOFT BASIC II 34.99
 CONV. LANGUAGE 14.99
 SYN FILE 34.99
 SYN CALC 26.99
 SYN TREND 19.99
 ASSEMBLER EDITOR 19.99
 MACRO ASSEMBLER 27.99
 PRINT SHOP 6.99
 BASIC CARTRIDGE 9.99
 CENTIPEDE 9.99
 RIVER RAID 9.99
 PITFALL II 9.99
 GAME-STAR BASEBALL 9.99
 MINER 2049ER 29.99
 BOUNTY BOB STRIKES 9.99
 MILLPEDE 9.99
 MS. PAC MAN 7.99
 PAC MAN 7.99
 STAR RAIDERS 9.99
 DONKEY KONG 23.99
 F 15 23.99
 ONE ON ONE 23.99

Antic
 The ATARI Resource

October Disk BONUS

G.U.P. Source Code

(Graphic Utility Package)

Complete assembly language listing
 for our popular June, 1985 program!
 (Requires either MAC/65 or Atari Assem-
 bler Editor.)

WHITE HOUSE COMPUTER

P.O. Box 4025, Williamsport, PA 17701

"Where Prices Are Born, Not Raised"

TOLL FREE 1-800-351-3442

PA CALL 1-717-322-7700

— PA Residents FREE Shipping —

PRINTERS

ATARI
 XTM 201 Non-Impact Dot Matrix 99.95
 XTC 201 Color Non-Impact Dot Matrix 109.95
 XDM 121 Daisy Wheel 209.95
 XMM 801 Dot Matrix Impact 169.95
 STC 504 Color/Non Impact 139.95
 STD 121 Daisy Wheel 219.95
 SMM 801 Dot Matrix/Impact 279.95

OKIDATA
 182 219.95
 84 640.95
 192 349.95
 193 525.95

CITIZEN
 MSP-10 305.00
 MSP-15 450.00
 MSP-20 450.00
 MSP-25 575.00

STAR MICRONICS
 SG 10 214.00
 SG 15 379.00
 SD 10 345.00
 SD 15 450.00
 SR-10 485.00
 SR-15 585.00
 Powertype 307.00

EPSON
 LX 80 239.00
 FX 80+ 339.00
 JX 80 479.00
 RX 100 369.00
 FX 100+ 489.00
 LQ 1500/P 995.00

PANASONIC
 1090 187.00
 1091 237.00
 1092 385.00
 1093 425.00
 3151 455.00

LEGEND
 1380 269.00
 1385 305.00
 880 199.00
 1080 229.00

C.ITOH
 8510-A 285.00

INTERFACES

850 108.95
 U-Print w/port. 49.95
 U-Print w/16k 69.95
 U-Print w/64k 89.95

PRINTER PAPER

2500 Shts Lazor Edge 24.95
 500 Shts Lazor Edge 9.95
 1000 Shts Lazor Edge 14.95

DISKETTES

SKC Lifetime Warr.
 SS/DD 10.95
 DS/DD 14.95

BONUS Lifetime Warr.
 SS/DD 9.50
 DS/DD 13.50

MAXELL
 MD1 15.95
 MD2 20.95

MODEMS

MPP 1000E 69.95
 Volks 12 179.95
 Hayes 300 149.95
 Hayes 1200 385.95

SYMPHONIC VHS VCR

\$279.00

MONDAY - FRIDAY 9 AM - 6 PM
VISA & MC ACCEPTED 4%

POLICY: No deposit on COD orders. Free freight on all prepaid cash
 orders over \$300 in the continental USA. APO & FPO add \$5.00 per
 hundred. For priority mail add \$8.00 per hundred. PA residents add 6%
 sales tax. Defective products must have Prior RA number. Schools net 15

COMPUTERS

800 XL 89.95
 130 XE 139.95
 520 ST Color RGB Monitor & More 870.95
 520 ST Monochrome Monitor & More 749.95

DISK DRIVES

Indus GT 205.95
 1050 164.95
 Happy 1050 335.95
 Happy Enhancer 160.95

MONITORS

TEKNIKA
 MJ-10 Color 185.95
 MJ-22 RGB 265.95

ZENITH
 ZVM 122 Amber 82.95
 ZVM 123 Green 75.95

AMDEK
 300G 119.00
 300A 129.00
 Color 300 229.00
 Color 500 339.00
 Color 600 399.00
 Color 700 469.00
 Color 710 539.00
 310A 145.00

XTRON
 Comcolor I 189.00

NEC
 1201 139.95
 1205 139.95
 1260 97.95

SAKATA
 SC-100 179.00

SOFTWARE

ATARI
 Proofreader 19.95
 Codewriter 42.95
 Filewriter 24.95
 Reportwriter 24.95
 Menuwriter 24.95
 Small Bus. Inven. 17.95
 Salesman's Expenses 17.95
 Accounts Rec/Pay 17.95
 The Learning Phone 23.95

BRODERBUND
 Print Shop 28.95
 Graphics Library I 17.50
 Graphics Library II 17.50

SYNAPSE
 Synfile 32.95
 Syncaic 32.95
 Syntrend 27.95

BATTERIES INCLUDED
 Paperclip/SPELL PK 69.95
 Paperclip 55.95
 Homepack 31.95
 Consultant 59.95
 Bus Card II 119.95
 BI 80 Column Card 99.95

SHOPPER'S GUIDE

HALLEY HUNTER!



THE COMET IS COMING...

And you can find it in your skies, armed with information from **HALLEY HUNTER** for your ATARI. Not a "Sky-Plot" Program, but a guide where to look in your SKY, NOT on your screen!

FOR SUGGESTED DATES & YOUR LOCATION:

- * Comet Coordinates
- * Earth Sun, Earth Comet Distances
- * Predicted Brightness
- * Where to Look
- * Direction on horizon & how high up!
- * Program Manual Packed with Tips & Hints: Best dates to observe, where, when & how.

CAPESTYLE SOFTWARE

Box 531
RFD 1
Mashpee, MA 02649

**Disk &
Manual
only 14⁹⁵**

Mail cashiers check, money order or personal check (allow 2 weeks to clear) add \$2 shipping & handling. Mass add 5% state tax

DISK-FIX™ disk utilities system

Features Include:

- File Recovery
- Disk Recovery and Salvaging
- Viewing / Editing of All Sectors
- Disassembly of Machine Programs
- Expanded Directory Display

Now Only \$39.95

(add \$2.00 postage/handling - Colorado residents add 3% sales tax)

Creative Software Ideas

**504 W. Grant Ave.
Pueblo, CO 81004**

Requires ATARI 800* DOS 2.0S min. 32K
Dealer Inquires Invited
* Trademark of ATARI, Inc.

ICEPIC PRINTER INTERFACE

WITH
FEATURE-PACKED GRAPHICS SOFTWARE
\$49.95 POSTPAID

- Direct-connect Atari to standard printer.
 - Works with 400/800, XL and XE models.
 - Supports parallel (Centronics) interface.
 - Complete: cable, diskette and user's guide.
 - Uses one joystick port, no 850.
 - Prints incoming data from 850-type modems.
 - Prints (dumps) text and graphics screens.
 - Atari and user fonts: many format variations.
 - EPSON and OKIDATA-92 compatible graphics.
 - Dump/restore screen to disk.
 - Special functions available from keyboard or by "printing" simple control sequences.
 - Many other highly useful functions.
 - 30 day money-back guarantee.
- Money order, check, VISA or Mastercard. Write for brochure. Quantity discounts.

ICECO

Integrated Computer Equipment Co.
8507 Natural Bridge Rd.
St. Louis, Missouri 63121
(314) 423-3390

Now available for the Atari

ASSEMBLER and LINKER

Software development using a linker is a two-stage process. First, each source file is assembled to a "relocatable" file. Then the relocatables are combined into an executable file using the linker.

The computer industry has long recognized this two-stage process to be vastly superior to those that translate source code directly to executable form.

Let us tell you more. Send for our brochure.

Brochure \$ 1.00

Assembler, linker, 70-page manual,
17-source sample program \$39.00

Hardware required: 48k, 1 disk, printer

Six Forks Software

11009 Harness Circle • Raleigh, NC 27614

VISA and MasterCard accepted



The Online Catalog of Computers and Software
Our Prices are **WHOLESALE + 10%**

SAMPLES!!!

Star Micronics SG-10 Printer — \$239
Atari 850 Interface — \$117
Indus GT Disk Drive — \$234
Olympia RO Daisy Wheel Printer — \$332
Atari 1050 Disk Drive — \$172
Batteries Included Home Pak — \$36

ASK ABOUT OUR FREE PRICE LIST
FREE SOFTWARE - FREE BULLETIN BOARD SERVICE

(408) 353-1836

We support the complete Atari product line.

Instant Shipping (or as fast as we can). Mastercard & Visa accepted (no extra charge). Shipping & handling add 6%. California customers add 6.5% sales tax. Order by phone Mon.-Fri. - 10 a.m.-5 p.m. PST. Order by modem daily 6 p.m.-9 a.m.) from our online Telecatalog.

Prices subject to change without notice.

COMPUCAT

24500 Glenwood Hwy., Los Gatos, CA 95030

SPARE PARTS FOR YOUR ATARI

Hard to find Integrated Circuits \$5. each

On CPU: GTIA, ANTIC, CTIA,

CPU 6502, CPU 6511

On 10K OS: Math ROM 399B, OS ROMs

499B & 599B

On 800/400 Main: Pokey, 6520 PIA

On 810 & 850: MPU 6507, PIA 6532,

RAM 6810, ROM C

Field Service Manuals 800/400, 800XL or 810 \$25 ea

For 1050 or 1200XL \$20 ea. For 410 or 835 \$15 ea

Diagnostic Cartridges Computer or Disk \$25 ea

B&C Computervisions

(408) 554-0666

3400 El Camino Real, #1,
Santa Clara, CA 95051

Hours: Tuesday-Friday 10am-7pm
Sat. 10am-5pm

Terms: UPS Shipments within USA Add \$5 COD
or prepaid. Calif. Res. add 6½% sales tax.



C.C.S.



187 CROSBY AVE., KENMORE, N.Y. 14217
716-873-4349

FREE box of disks with purchase of an Atari
800XL or 130XE AND disk drive

Atari 800XL	\$ 95.00
Atari 130XE	149.00
1050 Disk Drive	169.00
1025 Printer	159.00
Atari 520ST package: Disk Drive, & B/W monitor	\$659.00
Package with RGB color monitor	\$829.00
Other Disk Drives	
Indust GT	245.00
Rana 1000	175.00
Monitors	
BMC 12" gr. or am.	99.95
BMC 13" COLOR	219.95
Printers	
Lengend L880	219.00
Lengend L1080	239.00
Panasonic KXP 1090	205.00
Panasonic KXP 1091	265.00
Interfaces - We carry MPP's and Dignat Device Prods. at low prices. Special price when packaged with printer.	
BONUS DISK BOX - 11 SS/DD only \$10.50	
Others - BASF 10/box SS/DD	14.95
BASF 10/box DS/DD	16.95

Write or call for price list on Software, Hardware, and
other Peripherals.

Shipping: Add 2.50 for software; 5.00 for each hardware
(or actual charges if less). International orders pay
actual charges.

Terms: No COD orders. All orders will be shipped UPS or
best way.

Sorry: No refunds or exchanges UNLESS defective.

TURN YOUR ATARI 1030™ MODEM INTO A HAYES™ SMARTMODEM

WITH

SMART 1030

INCREASE THE CABABILITY OF YOUR 1030 AND
MAKE IT A POWERFUL COMMUNICATION TOOL.
WITH SMART 1030 YOU CAN:

- * USE THE INDUSTRY STANDARD HAYES™ COMMAND SET
- * UPLOAD/DOWNLOAD FILES DIRECTLY TO YOUR DISK DRIVE
- * PULSE OR TOUCH TONE™ DIAL
- * NO 850 INTERFACE MODULE™ REQUIRED, YET YOU CAN
USE MOST TERMINAL SOFTWARE WRITTEN FOR THE 850
- * USE LONG DISTANCE NETWORKS
- * AUTO DIAL DIRECTLY FROM A DISK STORED BBS DATA BASE
WHICH YOU CREATE

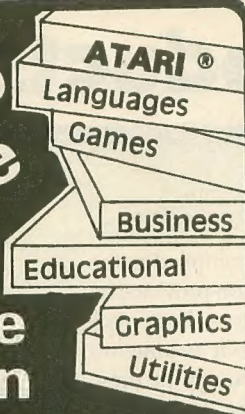
SMART 1030 IS A MACHINE LANGUAGE HANDLER THAT
ALLOWS YOUR 1030 OR 835 TO SIMULATE A HAYES™
SMARTMODEM. IT IS A MUST PROGRAM FOR ANY 1030 OR
835 OWNER. INCLUDED FREE IS THE TERMINAL SOFTWARE
PROGRAM AMODEM, WHICH SUPPORTS XMODEM
PROTOCOL AND UNLIMITED FILE SIZE TRANSFER.

E & B COMPUTER SERVICES \$19.95

P.O. BOX 292506 • COLUMBUS, OHIO 43229

VISA OR MASTERCARD CALL 614-891-4614, OR MAIL CHECK
(ALLOW TWO WEEKS FOR PERSONAL CHECKS TO CLEAR) WITH
\$2.00 FOR SHIPPING AND HANDLING.

JOIN CompuClub™ and receive the attention you deserve.



- ⌘ Receive our **disk** based catalog and pricebook.
- ⌘ Buy from people who specialize in ATARI exclusively.
- ⌘ Receive our 8 pg. newspapers 9 times a year filled with critiques, special tips, and classified ads.
- ⌘ Get at least 25% off **all** titles (and often more!).
- ⌘ Receive consistent low prices and prompt, knowledgeable service.
- ⌘ Choose from over 1,500 software items.

JOIN CompuClub™
Where Atari owners belong.

To join by phone **800-MY-ATARI™**
call toll free
In Mass. call 617-879-5232
Please have credit card number ready!
Or return this coupon with \$5.00*

YES, I want to be a preferred customer of CompuClub™. Rush me my catalog and price book. Enclosed please find my \$5.00 registration fee.

Please make check payable to CompuClub™
Payment enclosed ☐ check ☐ money order

Bill my ☐ Mastercard ☐ Visa Expires _____
ID# _____

Signature _____

Name _____

Address _____

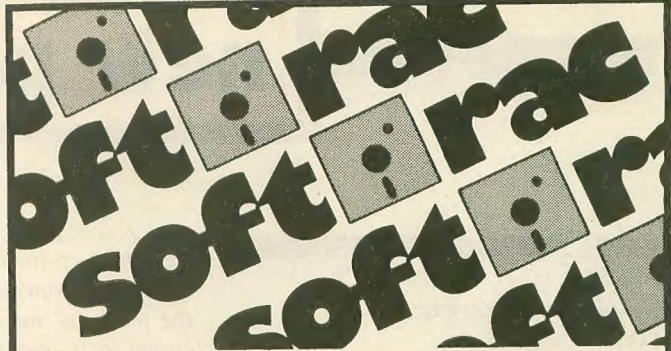
City _____ State _____ Zip _____

Atari Model _____

Hours: Mon. - Fri. 11:00 AM - 7:00 PM Eastern time
Answering services after hours
CompuClub™, P.O. Box 652, Natick MA 01760

*Overseas membership \$25.00 per year

⌘ Atari - Trademark of Atari Corporation



ATARI COMPUTERS

520 ST w/ 12" mono CALL
520 ST w/ 12" rgb CALL
260 ST CALL
260 STD (w/ drive) CALL
SF 354 (3.5" drive) CALL
130 XE CALL
1010 Recorder \$ 45
Atari Joysticks (pair) \$ 14

COMPUTER SPECIALS

800XL w/ 1050 drv \$ 259
Televideo TPC-1 \$ 999
Columbia PC-port. \$1099

PRINTERS

All Epson Printers CALL
All Okidata Printers CALL
All Star Printers CALL
All Atari Printers CALL
Okimate 10 w/ Interface \$199
NEC JC-1215 color \$199

DISK DRIVES

Atari 1050 CALL
Indus GT w/ softwa. CALL

MONITORS

Atari SM124 CALL
Atari SC 1224 CALL
Teknika 13" color \$190
Amdek 300 color \$239

MODEMS

Atari 1030 w/ soft. CALL
Atari 850 Interface CALL
All Hayes Modems CALL

DIGITAL DEVICES

Ape Face XLP \$ 59
Ape Face 12XLP \$ 59
Ape Face XLPS \$ 70
U-Print-A \$ 69
A16 Interface/Buffer \$ 99

DISKETTES

Maxell MD1 SS/DD \$ 19
Maxell MD2 DS/DD \$ 37
SKC SS/DD \$ 11
SKC DS/DD \$ 14
Wabash SS/DD \$ 14
Elephant SS/DD \$ 14
Elephant SS/DD \$ 18
Call for Quantity Prices

CLASSIC COVERS

1010 Recorder cov. \$ 7
1050 Drive cover \$ 7
1025 Printer cover \$ 7
1027 Printer cover \$ 7
800XL cover \$ 7

INNOV. CONCEPTS

Data Case \$ 11
Flip 'N' File II \$ 15

WICO

Ball Bat Joystick \$ 24

ATARI SOFTWARE

Accounts Rec/Pay \$ 12
Adventure Writer \$ 18

AtanLab Light

Module (R) \$ 34
AtanLabStarter (R) \$ 45
AtanWriter (R) \$ 35
Codewriter \$ 39
Filewriter \$ 21
Final Legacy \$ 15
Football (R) \$ 13
Home Filing Mgr. \$ 25
Home Integrator \$ 20
Menuwriter \$ 21
Microsoft Basic(RD) \$ 37
Retail Invoice \$ 12
Salesman Expense \$ 12
Small Business Inventory \$ 12
Star Voyager \$ 12
Track & Field (R) \$ 25

ACCESS

Beach Head \$ 24

AMER. EDUCATIONAL

All Titles \$ 17

BATTERIES INCLUDED

B-Graph \$ 48
Homepak \$ 35
Paperclip \$ 41

BRODERBUND

Bank St. Writer \$ 49
Printshop \$ 31
Graphics Library #1 \$ 19
Graphics Library #2 \$ 19

CBS SOFTWARE

Big Bird's Special Delivery \$ 19
Ernie's Magic Shapes \$ 19
Success w/ Math Series-All Titles \$ 19

DATASOFT

Bruce Lee \$ 28
Conan \$ 28
Dallas Quest \$ 24
Dig Dug \$ 19
Letter Wizard \$ 52
Lost Tomb \$ 24
Pac Man \$ 19
Pole Position \$ 19
Spell Wizard \$ 35

ELECTRONIC ARTS

Archon \$ 18
Archon II \$ 25
Axis Assassin \$ 10
Cut & Paste \$ 18
Debug \$ 10
Financial Cookbook \$ 30
Hard Hat Mack \$ 10
M.U.L.E. \$ 18
Music Construction Set \$ 18
One On One \$ 25
Pinball Construction Set \$ 18
7 Cities of Gold \$ 25
Word Flyer \$ 10
W.O.R.M.S. \$ 10

EPYX

Ball Blazer \$ 28
Pitstop II \$ 28

Rescue on

Fractalus \$ 28
Summer Games \$ 28

FIRST STAR

Romper Room ABC \$ 23
Spy vs. Spy \$ 22

INFOCOM

Cuthroat \$ 31
Deadline \$ 31
Enchanter \$ 24
Infidel \$ 28
Starcross \$ 31
Suspend \$ 31
Witness \$ 24
Zork I \$ 24
Zork II \$ 28
Zork III \$ 28

MICROLEAGUE SPORT

MicroLea Baseball \$ 28

MICROPROSE

F-15 Strike Eagle \$ 24
Kennedy Approach \$ 24
Mig Alley Ace \$ 24
Solo Flight \$ 24

MINDSCAPE

Crossword Magic \$ 36
Halley Project \$ 36

MUSE

Beyond Castle Wolfenstein \$ 24
Castle Wolfenstein \$ 20

OSS

Action (R) \$ 62
Action Tool Kit \$ 25
Basic XL (R) \$ 50
DOS XL \$ 25

SSI

Field Of Fire \$ 30
50-Mission Crush \$ 30
Kampfgruppe \$ 45

SUBLOGIC

Flight Simulator II \$ 35

SYNAPSE

Blue Max \$ 24
Blue Max 2001 \$ 21
Essex CALL
Mindwheel CALL
SynCalc \$ 35
SynComm \$ 28
SynFile \$ 35
SynStock \$ 28
SynTrend \$ 28
Quasimodo \$ 17

TRONIX

Chatterbee \$ 28
S.A.M. \$ 42

XEROX

Stickybear ABC \$ 29
Stickybear Basket & Bounce \$ 25
Stickybear Bop \$ 25
Stickybr. Numbers \$ 29
Stickybr. Opposites \$ 29



To Order Call Toll Free: 1 (800) 545-0111
Orders Only Please!

All Titles On Disk unless marked (R) for ROM Cartridge.
Ohio Residents and Customer Service Please Call: 1 (513) 322-6314
Order Lines Open: 10 a.m. to 6 p.m. Mon.-Fri.; 10 a.m. to 4 p.m. Sat. (EST)
Minimum \$10 order. No extra charge for VISA or MasterCard. C.O.D. add \$3. We prepay and add actual freight charges to all hardware orders. Software freight charges: \$10-\$100 add \$3; \$101-\$250 add \$5. **Orders Over \$250 Shipped FREE In Continental U.S.** Actual Freight will be charged outside Continental U.S. and APO. Ohio residents add 6% sales tax. For immediate delivery use bank cards, cashier's check, or money order. Personal/Company checks allow 3 weeks to clear. **School Purchase Orders welcome.** Due to our low prices, all sales are final. NO CREDITS. All defective returns must have a return authorization number. Please write or call our Customer Service Number to obtain RA#. **Send \$2 for our Complete Catalog (refundable with purchase).**

P.O. Box 2052, Springfield, Ohio 45501

new products

GENIE

(software)

New Horizons Software
P.O. Box 180253
Austin, TX 78718
(512) 280-0319
\$29.95, 48K disk

Genie is a unique new product for the Atari that allows you to temporarily suspend whatever you are doing and access four extra functions. When you are finished, the program returns you to exactly where you left off. The four functions are: Genie Note Pad, a 150 line scratch pad for your sudden inspirations; Genie Calculator, a five function decimal/hexadecimal calculator with a memory; ATASCII Table, a handy reference for those graphic characters you sometimes forget; and DOS Functions, providing instant DOS access. Genie does not use up memory space, and it automatically saves the contents of the Calculator and the Notepad.



COMP-U-TEMP

(temperature sensor)

Applied Technologies, Inc.
Computer Products Division
Lyndon Way
Kittery, ME 03904
(207) 439-5074
\$109.95, 48K disk

A new breakthrough in low-cost data logging and temperature monitoring, this package gives your Atari a real-world interface. **Compu-U-Temp** combines the following features: labelling

New Products notices are compiled by the **Antic** staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.

of sensor locations, high temperature or low temperature alarm settings, hardcopy printouts, sampling of temperature at different time intervals and recording of temperature data to disk. Ideal for laboratories, greenhouses and school science projects.

MINDWHEEL

(software)

Synapse & Broderbund
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170
\$39.95, 48K, Two disk drives

An ambitious and long-awaited series of interactive text adventure games called "Electronic Novels." You'll go into the heart of fictional worlds. Complex interaction is made possible by a sophisticated parser and random events. Instead of puzzles, you are presented with something much more like a story. **Mindwheel** is the first of the series to be released for the Atari. It is a journey into the minds of four people of extraordinary power, all linked to a common neuro-electronic matrix. The next novel will be **Essex**, an intergalactic search-and-rescue mission.

BASIC XE

(software)

Optimized Systems Software
1221B Kentwood Avenue
San Jose, CA 95129
(408) 446-3099
\$79, 48K cartridge and disk

BASIC XE is the first programming language designed especially for the 128K memory of the new Atari 130XE computer. But it will also work with XL models. Features a host of new commands and is upwardly compatible to BASIC XL and Atari BASIC. Claimed

to be 2 to 6 times faster than Atari BASIC. Provides auto line numbering, renumbering, program cross referencing, English error messages.



COMPETITION PRO MODEL 3000, 5000 & 200X

(joysticks)

Competition Pro
2609 Greenleaf Avenue
Elk Grove, IL 60007
(312) 228-1810
\$15.95, \$17.95 & \$8.95 respectively

Three new models from one of the best-known joystick manufacturers. Each stick features a different control mechanism. The **Model 5000**, designed to bring "arcade feel" to the Atari, features a microswitch assembly for greater accuracy and higher scores. The **Model 3000** "flight control joystick" (pictured) has both top and trigger fire buttons and uses 8-way leaf-switches for precise directional control. The **200X** joystick uses a highly reliable spring switch mechanism and features a handle especially designed for comfort during long hours in front of the screen. All three come with an extra-long five foot cord and are covered by an unconditional two-year warranty.

Return the favor. When you call a manufacturer or supplier about a product you've seen advertised or otherwise mentioned in ANTIC, please tell them so. This will help us to continue to bring you the latest information about products that will make your Atari computer an even more valuable investment in the future. —ANTIC ED



BASIC XE™ Gives Your Atari 130XE™ All The Performance It Should Have Had In The First Place



Available July 1st

In the home computer races, the Atari 130XE stands out as a price leader. But using underpowered Atari BASIC™ on this otherwise fine machine is like racing in the Indy 500 with half your cylinders missing. So don't get left at the starting line with only half an "engine." Change to the performance leader **now!** Buy BASIC XE from OSS, the **only** programming language designed especially for the Atari 130XE.

Just look at what you get for one low sticker price:

BEST MILEAGE: With over 60,000 **more** bytes for your programs, BASIC XE lets you use all the memory you paid for.*

MORE HORSEPOWER: Run Atari BASIC programs 2 to 6 times faster.* Even with its incredible power, BASIC XE is compatible with Atari BASIC.

BETTER HANDLING: With auto line numbering, renumbering, program cross referencing, English error messages, and more.

CLASSIC DESIGN: Show off the sleek **structured** style of your own programs when you use BASIC XE statements like PROCEDURE, IF...ELSE, and WHILE...ENDWHILE.

FREE ACCESSORIES: Get over \$100 worth of Atari BASIC options **FREE** when you buy BASIC XE: complete Player/Missile Graphics support, string arrays, DOS access, SORT commands, readable listings...over 50 extras at no additional charge.

- If you're ready to step up to real performance...YOU need BASIC XE now!
- If you haven't written your first BASIC program...YOU need BASIC XE now!
- If you're already a real pro in BASIC...YOU need BASIC XE now!
- **BASIC XE may well be the best buy any Atari owner ever made.**

*Want to know more? Call or write for free brochure or ask your local dealer.
Atari 130XE™ and Atari BASIC™ are U.S. registered trademarks of Atari Corporation.



Optimized Systems Software, Inc.
1221B Kentwood Avenue, San Jose, California 95129 (408) 446-3099

AMERICA WE BUILT IT FOR YOU THE ATARI 520ST

"We promised.
We delivered.
With pride,
determination,
and good old
ATARI know how."
Sam Tramiel,
President,
ATARI CORP.

The 520ST simply obsoletes all current personal systems — even those costing thousands of dollars more. Beneath its full stroke 94-key keyboard is an operating environment so intelligent that it puts you in command almost at once. It's that easy.

No other computer we know of has been awaited with such anticipation, has received so much national and trade press, and has been so unanimously acclaimed — as the remarkable 520ST.

And for good reason. Its development represents a bold, new standard in personal computing power.

Graphic symbols quickly identify available functions. Menus appear just by aiming

the mouse. Point to a specific operation, click the mouse and instantly you are able to develop full color charts, recall files from within folders, and so much more.

And when you combine 524,288 bytes of RAM with ATARI's custom circuits and the horsepower of a 68000 microprocessor, you own a powerful computer that delivers crisp, high resolution images with incredible speed.

With a monochrome monitor your 520ST displays 640 x 400 pixels of extremely high resolution clarity. Select a color monitor and you are able to create beautiful graphs and diagrams from a palette of 512 vivid colors.

Power to grow. An array of expansion ports allow you to easily customize your 520ST. There are standard serial and parallel interface

ports for connecting printers and telecommunications equipment, MIDI connectors to interface with music synthesizers and keyboards, and 3.5 inch floppy disk, cartridge and joystick ports. There is also a hard disk port with the lightning communications speed of 1.33

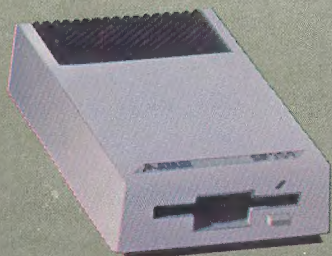
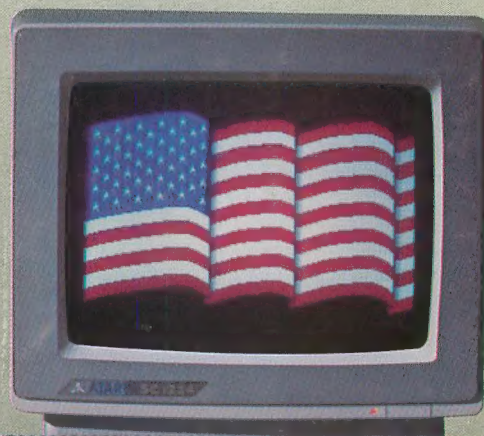
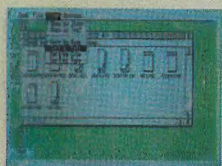
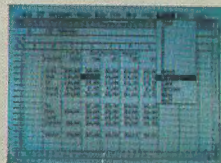
Megabytes per second. ATARI 520ST systems are available now.

When it comes to state-of-the-art technology ...don't settle for less. And when it comes to price ...don't pay a penny more.

For the dealer nearest you call 408/745-2367.

Or write to:
ATARI Corp.

Customer Service
1196 Borregas Ave.
Sunnyvale, CA 94086



The New



ATARI®

Power Without the Price

\$799⁹⁵

*plus state and local taxes where applicable.

SYSTEM INCLUDES: 520ST Personal Computer, Monochrome Monitor, Mouse Controller, 3.5 inch Disk Drive, TOS™ - The Operating System Disk, ATARI Logo™ Language Disk
With full color monitor: \$999.95*